

National Aeronautics and Space Administration

Ames Research Center
Moffett Field, California 94035



April 19, 2016

Ms. Julianne Polanco
State Historic Preservation Officer
Office of Historic Preservation
Department of Parks & Recreation
1725 23rd Street, Suite 100
Sacramento, CA 95816
Attn: Mr. Mark Beason

Subject: NASA Section 106 Consultation: Defense Fuel Support Point Closure Project at
Ames Research Center, Moffett Field, California

Dear Ms. Polanco:

As part of its responsibilities under Section 106 of the National Historic Preservation Act (NHPA), the National Aeronautics and Space Administration (NASA) is requesting consultation for the Defense Fuel Support Point (DFSP) Closure Project (project or undertaking) located at Ames Research Center (ARC) at Moffett Field, California. NASA, as the lead agency under NHPA, has determined that this project constitutes an undertaking. NASA requests review and consultation concerning the project as described in the attached *Historic Property Survey Report for the Defense Fuel Support Point Closure Project at Ames Research Center, Moffett Field, California*. NASA requests the State Historic Preservation Officer's (SHPO) concurrence on NASA's determinations of eligibility for resources identified in the report, and that NASA's finding of no adverse effect is appropriate for this project, pursuant to 36 Code of Federal Regulations (CFR) 800.5(b).

The Defense Logistics Agency (DLA) proposes to permanently close the DFSP, a fuel storage and distribution facility at Moffett Federal Airfield that is owned by NASA and has not been in use since 2003. As a result of this project, 4,443 lineal feet of pipeline corridor would be closed by excavation and removal, and 4,102 lineal feet of pipeline corridor would be closed in place. The existing fuel facility infrastructure would be physically disconnected, abandoned in place, dismantled, and/or demolished based on consultation with the County of Santa Clara's Hazardous Materials Compliance Division and pursuant to the *State of California Underground Storage Tank Requirements*, CCR Title 23, Division 3, Chapter 16, Article 7. In areas where excavation of pipelines would impact sensitive landscape features, pipelines would be closed in place, specifically those sections where removal by excavation/demolition may damage

structures such as nearby underground utilities, aircraft ramps and taxiways, mature vegetation, and wetlands or U.S. waters.

NASA has delineated the Area of Potential Effects (APE) to include the project footprint and adjacent areas where historic properties may be indirectly impacted. An archaeological pedestrian survey and intensive built environment survey were conducted. No archaeological resources in the APE. The APE is located within Moffett Federal Airfield, which was determined to be contributing to the NAS Sunnyvale Historic District in 2013. Other NRHP-listed contributors to the district in the APE include Hangars 2 and 3, and Building 55. Features of the airfield are also located in the APE and were evaluated for significance.

Based on the cultural resources study, NASA has determined that the aircraft parking apron (MF1002) and aircraft taxiway (MF1016) are character-defining features of the airfield, which contributes to the NAS Sunnyvale Historic District. NASA has also determined that Building 69, Building 439, and the DFSP, including several individual DFSP components are not individually eligible, character-defining features of the airfield, or contributors to the NAS Sunnyvale Historic District. NASA is seeking the SHPO's concurrence with these determinations.

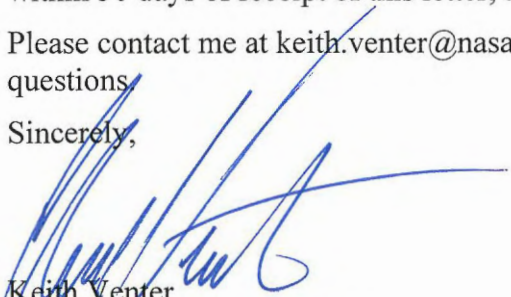
NASA, in applying the Criteria of Adverse Effect on the proposed project activities, has determined that the undertaking's impact would not constitute an adverse effect due to its minimal impact on the ability of the adjacent historic properties in the APE to convey their historical associations that make them eligible for the NRHP. In the event there is an inadvertent discovery of archaeological resources during the Undertaking, NASA will comply with best management practices as outlined in the 2014 Draft Integrated Cultural Resources Management Plan Standard Operating Procedure 8: Inadvertent Discovery of Archaeological Resources.

Pursuant to 36 CFR 800.5(c), NASA will make its finding of no adverse effect for this undertaking available to the public and any consulting parties, as specified in 36 CFR 800.11(e). Currently, there are no federally recognized Native American Tribes associated with the geographic boundaries of the APE. Under the National Environmental Policy Act (NEPA) environmental review process for this project, DLA will publish a Notice of Availability in the *San Jose Mercury News* newspaper for the Environmental Assessment for the project, including the attached cultural resources report. DLA will also make the Environmental Assessment available to the public online, in the Federal Register, and at the Mountain View Public Library.

NASA is seeking the SHPO's concurrence with NASA's finding that the proposed undertaking will have no adverse effect on historic properties. NASA requests the SHPO's concurrence within 30 days of receipt of this letter, as specified in 36 CFR 800.5(c).

Please contact me at keith.venter@nasa.gov or at (650) 604-6408 with your comments or questions.

Sincerely,



Keith Venter
Historic Preservation Officer



Ames Research Center

Ames Research Center, MS 213-8
Moffett Field, California 94035

cc:

HQ/EMD/Ms. Rebecca Klein, Ph.D., RPA

DLA/Mr. Patrick Brown

Attachment

Historic Property Survey Report for the Ames Research Center Defense Fuel Support Point Closure Project, Moffett Field, California (April 2016). Prepared by AECOM.

**HISTORIC PROPERTY SURVEY REPORT FOR
THE DEFENSE FUEL SUPPORT POINT CLOSURE PROJECT
AT AMES RESEARCH CENTER, MOFFETT FIELD, CALIFORNIA**

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April 2016

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EXECUTIVE SUMMARY

The Defense Logistics Agency (DLA), under the Department of Defense, proposes the Defense Fuel Support Point (DFSP) Closure Project (project or undertaking) located at Ames Research Center (ARC) at Moffett Field, California. The project is located on lands under the jurisdiction of the National Aeronautics and Space Administration (NASA), which is the lead agency for the purposes of Section 106 review under the National Historic Preservation Act (NHPA). NASA has determined that this project constitutes an undertaking under the NHPA. In support of NASA's obligations under NHPA, NASA requested AECOM to conduct a historic properties study of the project. AECOM conducted research and survey to identify historic properties that may be affected by the project, and prepared this report to document the survey findings and the potential effects on historic properties as a result of the project.

The project proposes to permanently close the DFSP, an onshore fuel storage and distribution facility, which has not been in use since 2003. Five underground storage tanks and associated pipelines, fueling hydrants, truck filling rack, and associated infrastructure and appurtenances would be closed, removed, and/or abandoned in place. In total, 4,443 lineal feet of pipeline corridor would be closed by excavation (maximum excavation depth anticipated to approximately 10 feet) and demolition, and 4,102 lineal feet of pipeline corridor would be closed in place. An area of potential effects was delineated to include the project footprint and adjacent areas that could be indirectly affected by the project.

An archaeological pedestrian survey and an intensive built environment survey were conducted on March 21, 2016. The survey identified no archaeological resources and 15 buildings and structures (Table ES-1). Of the 15 resources, three resources are listed in the National Register of Historic Places (NRHP) as contributors to the NAS Sunnyvale Historic District, eight resources are features of the DFSP fueling facility, and the remaining four resources are miscellaneous features of the airfield.

Resources were evaluated under the NRHP criteria. Two resources, MF1002, an aircraft parking apron, and MF1016, an aircraft taxiway, are recommended as character-defining features of the airfield that is an eligible contributor to the NAS Sunnyvale Historic District under NRHP Criterion A. In addition, 10 resources are recommended not eligible for the NRHP.

As a result of the assessment of effects, it appears that the project will have no adverse effect on the NAS Sunnyvale Historic District as a whole, or its contributors located in the APE, including Hangars 2 and 3, Building 55, and the airfield. The significance of these historic properties is associated with aviation missions related to several themes, including the Navy dirigible and lighter-than-air operations, the Army Air Corps's research and mission, Navy transport operations, and Navy jet aircraft operations. The project proposes the permanent closure and partial removal of the DFSP, historically the jet fueling facility, which served a supporting utilitarian function of the airfield during the period of significance from 1953 to 1961, and was closed in 2003. Due to its support function and the integrity of some of its significant

Table ES-1. Survey and Evaluation Results in the APE

Building No.	Historic Name (Current Name)	Year Built	NRHP Evaluation	Effects Analysis
46	Hangar 2	1942	Listed Contributor (NAS Sunnyvale HD)	No Adverse Effect
47	Hangar 3	1942	Listed Contributor (NAS Sunnyvale HD)	No Adverse Effect
55	Boiler House (Hangars 2 and 3)	1943	Listed Contributor (NAS Sunnyvale HD)	No Adverse Effect
69	Inert Ammunition Storage	1943	Not Eligible	No Historic Properties Affected
137	Aircraft Fuel Storage Tank*	1952	Not Eligible	No Historic Properties Affected
138	Aircraft Fuel Storage Tank*	1952	Not Eligible	No Historic Properties Affected
139	Aircraft Fuel Storage Tank*	1952	Not Eligible	No Historic Properties Affected
140	Aircraft Fuel Storage Tank*	1952	Not Eligible	No Historic Properties Affected
141	Tank Truck Filling Rack*	1952	Not Eligible	No Historic Properties Affected
169	Vehicular Bridge*	1953	Not Eligible	No Historic Properties Affected
439	Aircraft Wash Rack	1942	Not Eligible	No Historic Properties Affected
953	Aircraft Ready Fuel Day Tank and Pumping Station*	1956	Not Eligible	No Historic Properties Affected
MF1002	Aircraft Parking Apron	1945	Character-Defining Feature of Eligible Contributor (NAS Sunnyvale HD)	No Adverse Effect
MF1003	High-Speed Aircraft Fueling Pits*	1955	Not Eligible	No Historic Properties Affected
MF1016	Aircraft Taxiway (East Parallel)	1945	Character-Defining Feature of Eligible Contributor (NAS Sunnyvale HD)	No Adverse Effect

*feature of the Jet (DFSP) Fueling Facility

components directly related to the aviation mission of the airfield, the jet fueling facility does not appear to be a character-defining feature of the airfield. In applying the Criteria of Adverse Effect and the Advisory Council on Historic Preservation's guidelines for considering the changing nature of highly technical facilities in assessing the effects of project activities, it appears that a finding of no adverse effect is appropriate.

INTRODUCTION

The Defense Logistics Agency (DLA), under the Department of Defense, proposes the Defense Fuel Support Point (DFSP) Closure Project (project or undertaking) located at Ames Research Center (ARC) at Moffett Field, California. The project is located on lands under the jurisdiction of the National Aeronautics and Space Administration (NASA), which is the lead agency for the purposes of Section 106 review under the National Historic Preservation Act (NHPA) (36 Code of Federal Regulations (CFR) 800.5(b)). NASA has determined that this project constitutes an undertaking under the NHPA. In support of NASA's obligations under NHPA, NASA requested AECOM to conduct a historic properties study of the project. AECOM conducted research and survey to identify historic properties that may be affected by the project, and prepared this report to document the survey findings and the potential effects on historic properties as a result of the project.

DESCRIPTION OF THE UNDERTAKING

The project proposes to permanently close the DFSP, an onshore fuel storage and distribution facility, which has not been in use since 2003. The DFSP fuel facility has eight primary components:

- Bulk storage tank area (including Buildings 137–140), also referred to as the tank farm or fuel farm;
- Day tank area (including Building 253);
- Building 141, the truck filling rack;
- Four high-speed aircraft fueling hydrants (MF1003);
- Two 10-inch-diameter underground fuel dock pipelines in a 3,010-foot-long corridor;
- One 8-inch-diameter underground day tank pipeline in a 2,100-foot-long corridor;
- Two 6-inch-diameter underground trucking filling rack pipelines in a 1,165-foot-long corridor; and
- Two underground fuel hydrant pipelines in a 2,270-foot-long corridor.

Five underground storage tanks (USTs) and associated pipelines, fueling hydrants, truck filling rack, and associated infrastructure and appurtenances would be closed.

Within the fence boundaries of the fuel farm area and day tank area, all tanks, pipelines, buildings, and associated infrastructure and appurtenances would be cleaned, abated, and/or removed by demolition/excavation. Tanks and pipelines would be cleaned to remove fuel residuals prior to removing or abandoning, in accordance with Certified Unified Program Agencies (CUPA) regulations. Hazardous building materials such as asbestos gaskets and loose (flaking) lead-containing paint would be abated prior to demolition, per federal and state

regulations. Contaminated soil encountered during the removal operation would be excavated and characterized for waste disposal in accordance with the Closure Plan (OTIE 2015) to be reviewed and approved by the Health and Hazardous Materials Compliance Division (HMCD) of Santa Clara County. The reinforced concrete tank floors would be perforated and left in place. The proposed project would only handle the amount of contaminated soil necessary to accomplish the removal project. Further excavations would be no larger than necessary, and the bulk of contaminated soil, if any, would be left in place for potential cleanup during a later action. Other actions are as follows:

- The truck filling rack (Building 141) would be left in place. At the truck filling rack, the aboveground portion of the fuel system would be abated and cleaned. The below grade pipeline would be closed in place. The hardscape (e.g., pavement, pads, and curbing) would be left in place.
- Within the pipeline corridors, approximately 300 lineal feet of aboveground piping would be cleaned, abated, and demolished. 15,133 lineal feet of underground pipelines would be cleaned, abated, and demolished where practical. In areas where demolition/excavation of pipelines would impact sensitive site features, pipelines would be closed in place, specifically those sections where removal by excavation/demolition may damage structures such as nearby underground utilities, aircraft ramps and taxiways, mature vegetation that is part of the golf course recreation facility, and wetlands or waters of the U.S. Those underground pipeline segments closed in place would be cleaned and would be sealed at each end. In summary, 4,443 lineal feet of pipeline corridor would be closed by excavation/ demolition and 4,102 lineal feet of pipeline corridor would be closed in place. After pipeline removal is complete, the area would be filled using on-site soil, supplemented by imported soil as necessary, to restore the topography to match the surrounding grade. Backfilled excavations would be compacted to engineering standards, and vegetation would be restored to match surrounding vegetation.
- At the fuel hydrants, the above grade equipment would be cleaned, abated, and removed by demolition. The below grade pipeline would be closed in place. The hardscape (e.g., pavement, pads, and curbing) would be left in place.
- Utilities that serviced the fuel system would be disconnected and secured.
- A total of 6.77 acres would be disturbed by the closure/demolition activities. Approximately 24,432 cubic yards of soil would be excavated and stockpiled while infrastructure is being demolished. That soil would be used to backfill after demolition is completed. Approximately 3,717 cubic yards of soil would be imported to complete backfill.
- A Closure Plan¹ (OTIE 2015) has been prepared to describe the work to be performed and the environmental closure commitments. The Closure Plan (OTIE 2015) would be

¹ A Closure Plan is a plan that describes the procedures for terminating the storage of hazardous materials and/or hazardous wastes in a storage facility in a manner that (1) eliminates or minimizes the need for further maintenance; (2) eliminates or minimizes any threat to public health, safety, or the environment from residual hazardous materials or hazardous wastes in the facility; and (3) demonstrates that the hazardous materials and/or hazardous wastes that

submitted to the HMCD, the lead agency overseeing tank closure under the *State of California Underground Storage Tank Requirements*, California Code of Regulations Title 23, Division 3, Chapter 16, Article 7.

- Once closure/demolition activities are complete, the disturbed areas would be graded to restore topography to match surrounding grade, compacted to engineering standards, and hydroseeded with a local native seed mix.
- Within the pipeline corridors, aboveground pipelines would be cleaned, abated, and demolished.
- Prior releases of fuel occurred at the facility; therefore, this project includes provision for sampling and disposal of approximately 3,210 tons of petroleum-contaminated soil, in the event it is encountered. Any follow-on investigation and remediation is not part of this project. The provision for 3,210 tons of petroleum-contaminated soil is based on 10 percent of the excavated soil from the day tank area and fuel farm being petroleum-contaminated (assuming 1.4 tons/bank cubic yard). It is estimated that 3,210 tons of petroleum-contaminated soil would be removed and disposed of at the Altamont Landfill in Livermore, California, 51 miles from the work site.

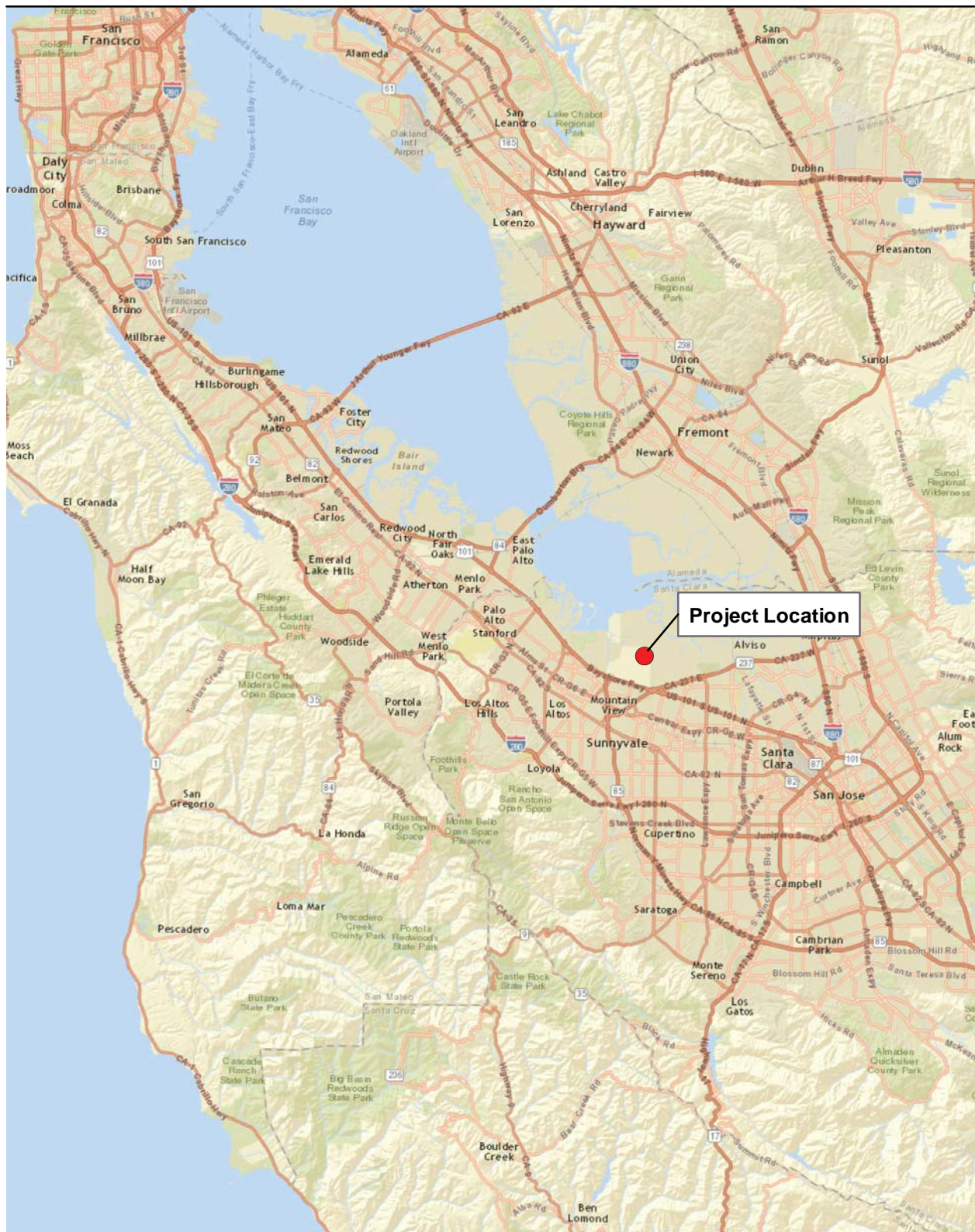
Area of Potential Effects

The area of potential effects (APE) was delineated to encompass the project footprint, including all areas of excavation, demolition, and abandonment of the DFSP fueling facility (Figure 3). For archaeological resources, the APE is defined as the limits of disturbance, including areas of temporary staging and construction ground disturbance. Where the project proposes only excavation of subsurface pipeline, the APE is limited to the footprint of that activity. Excavation is proposed to the depth and width of the previously disturbed area of the pipeline, so the vertical APE extends to the approximate depth of the pipeline, which varies throughout the pipeline corridor. Excavation is anticipated to a maximum depth of approximately 10 feet, but will be determined during construction. The proposed APE boundary also includes built environment historic properties in the vicinity of the project footprint that may be indirectly affected through visual or contextual alterations. Due to the proposed removal of the day tank area (Building 953) and surficial elements of the high-speed fueling pits (MF1003) that would create a visual change near the airfield, a portion of the east side of the airfield within immediate view of these resources, including Hangars 2 and 3, was included in the APE.

Personnel

This investigation was conducted by M.K. Meiser, M.A., and Jennifer Redmond, M.A., R.P.A. Ms. Meiser and Ms. Redmond are both qualified under the Secretary of the Interior's Standards (36 CFR Part 61) for architectural history and history, and archaeology and history, respectively. Resumes for key personnel are included in Appendix A.

were stored in the facility would be removed, disposed of, neutralized, or reused in an appropriate manner (CUPA, Chapter 8.20).



Source: ESRI 2015

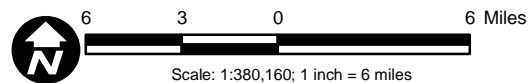
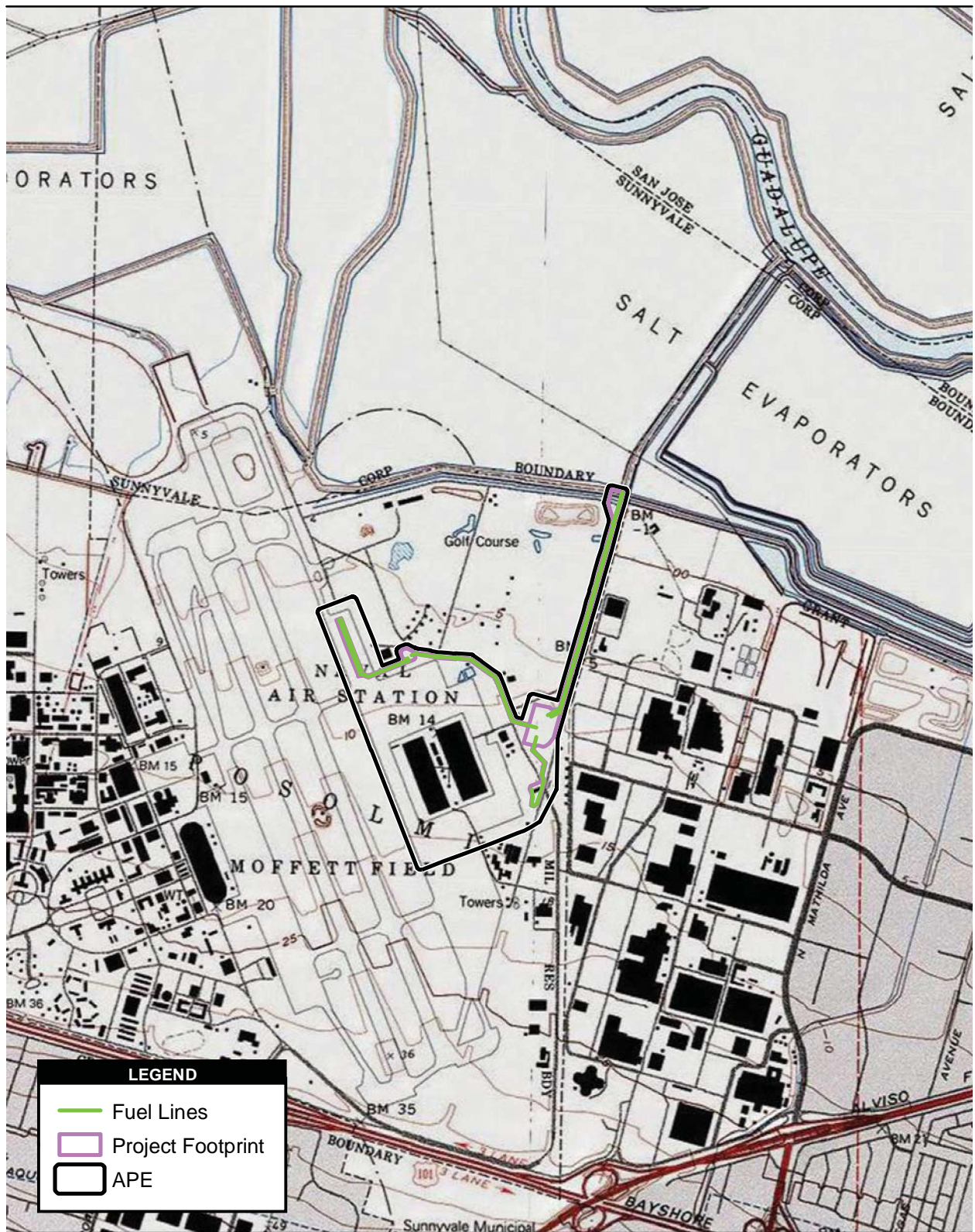


Figure 1
Project Location



Source: Microsoft 2015; ESRI 2015

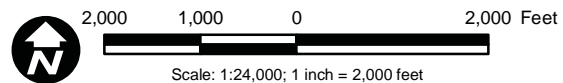


Figure 2
Site Location

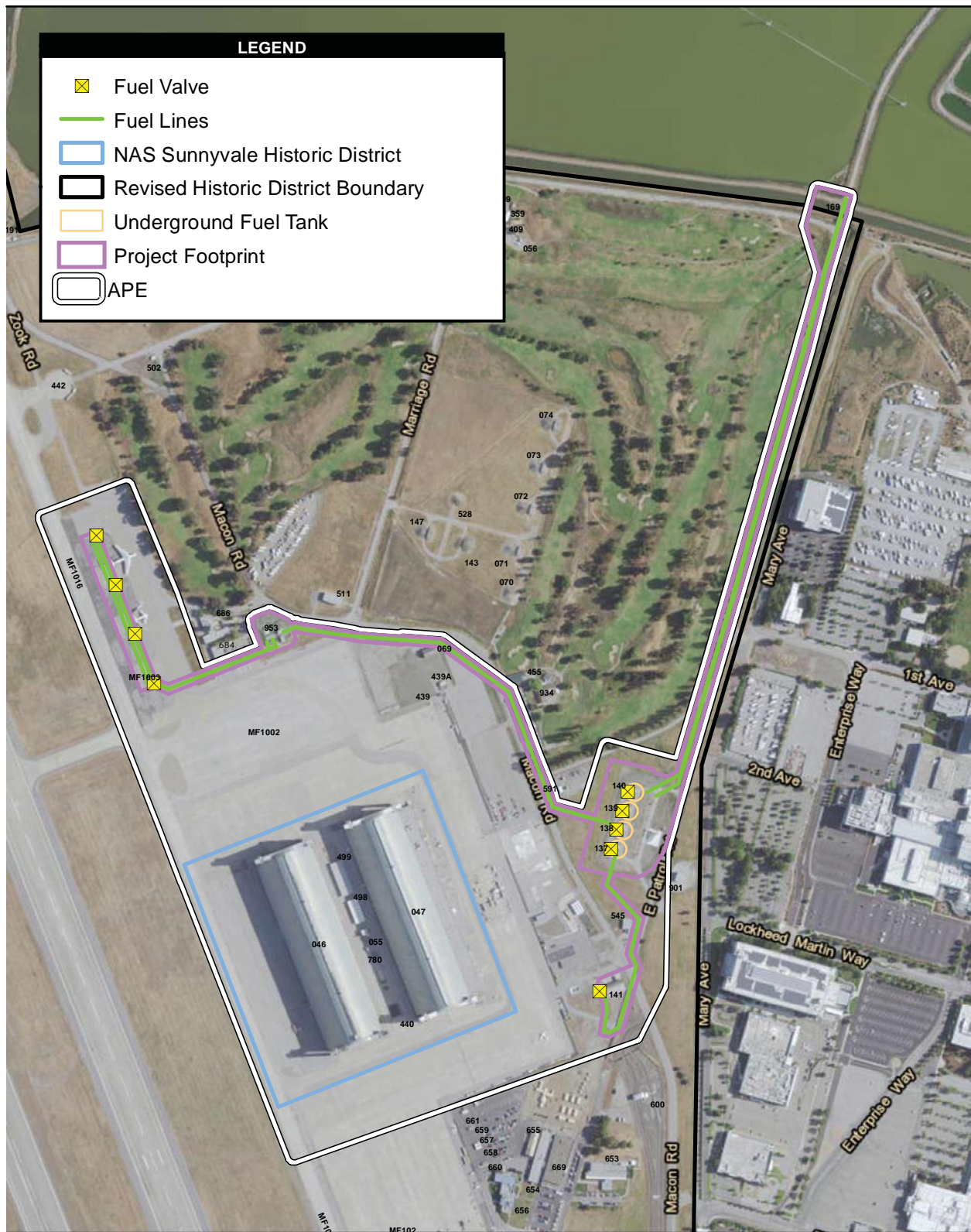


Figure 3
Area of Potential Effects

PROJECT SETTING

HISTORICAL CONTEXT

The historical context for Moffett Field has been previously established in the *Historic Property Survey Report for the Airfield at NASA Ames Research Center, Moffett Field, California*, prepared by AECOM in 2013 (AECOM 2013). The following sections regarding the general history of Moffett Field are excerpted from that report. Additional information specific to the DFSP fueling facility is also included.

Pre-Military Period (to 1930)

The earliest well-documented entry and spread of native peoples throughout California occurred at the beginning of the Paleo-Indian Period (12,000–8000 years Before Present [B.P.]), and social units are thought to have been small and highly mobile. Known sites have been identified in the contexts of ancient pluvial lakeshores and coastlines, as evidenced by such characteristic hunting implements as fluted projectile points and flaked stone crescent forms. Prehistoric adaptations over the ensuing centuries have been identified in the archaeological record by numerous researchers working in the Bay Area since the early 1900s, as summarized by Fredrickson (1974) and Moratto ([1984] 2004).

Few archaeological sites have been found in the Bay Area that date to the Paleo-Indian Period or the subsequent Lower Archaic (8000–5000 B.P.) time period, probably because of high sedimentation rates and sea level rise. However, archaeologists have recovered a great deal of information from sites occupied during the Middle Archaic Period (5000–2500 B.P.). By this time, broad regional subsistence patterns gave way to more intensive procurement practices. Economies were more diversified, possibly including the introduction of acorn-processing technology, and populations were growing and occupying more diverse settings. Permanent villages that were occupied throughout the year were established, primarily along major waterways. The onset of status distinctions and other indicators of growing sociopolitical complexity mark the Upper Archaic Period (2500–1300 B.P.). Exchange systems became more complex and formalized, and evidence of regular sustained trade between groups was more prevalent.

Several technological and social changes characterize the Emergent Period (1300–200 B.P.). Territorial boundaries between groups became well established, and it became increasingly common for distinctions in an individual's social status to be linked to acquired wealth. In the latter portion of this period (500–200 B.P.), exchange relations became highly regularized and sophisticated. The clamshell disk bead became a monetary unit, and specialists arose to govern various aspects of production and material exchange.

The Middle Archaic, Upper Archaic, and Emergent Periods can be broken down further, according to additional cultural manifestations that are well represented in archaeological assemblages in the Bay Area:

- *Windmill Pattern* (5000–1500 B.P.) peoples placed an increased emphasis on acorn use and on a continuation of hunting and fishing activities. Ground and polished charmstones, twined basketry, baked clay artifacts, and worked shell and bone were hallmarks of Windmill culture. Widely ranging trade patterns brought goods in from the Coast Ranges and trans-Sierran sources, as well as from closer trading partners.
- *Berkeley Pattern* (2200–1300 B.P.) peoples exhibited an increase in the use of acorns as a food source, compared to what was seen previously in the archaeological record. Distinctive stone and shell artifacts differentiated this period from earlier or later cultural expressions. Burials were most often placed in a tightly flexed position and frequently included red ochre.
- The *Augustine Pattern* (1300–200 B.P.) reflected increasing populations, resulting from more intensive food procurement strategies, as well as from a marked change in burial practices and increased trade activities. Intensive fishing, hunting and gathering, complex exchange systems, and a wider variety in mortuary patterns are all hallmarks of this period.

Ethnographic and archaeological research indicate that ARC falls within the traditional boundaries of the Ohlone, whose territory stretched from San Francisco Bay at the north to the southern tip of Monterey Bay, extending 60 miles inland (NASA 2002). The primary social organization of this group was centered around the patrilineal family unit, with a focus on patrilocality, and sovereign tribelets were often defined by territorial holdings (Bennyhoff 1977). ARC is located on Ramaytush and Tamien (Tamien) lands of the Ohlone sphere of influence and has been specifically associated with the Posol-mi tribelet (a place name likely associated with the Rancho Posolmi discussed below) (NASA 2009; Kroeber 1925). The total number of individuals residing in this area has been estimated as high as 1,200 at the time of European contact; however, the combined effects of missionization and European-borne diseases had a heavy toll on these communities, nearly decimating the population and traditional practices (NASA 2009).

In 1772, the Spanish, led by Juan Bautista de Anza, began exploring the inner coastal region of California. Later, Spanish settlers established a permanent presence by constructing missions and presidios. When Mexico became independent from Spain in 1822, the Spanish missions were secularized and their lands were redistributed to private individuals by way of land grants. Large parcels were developed into cattle ranches, maintained by Mexican grantees.

In 1844, the Rancho Posolmi, on which ARC lands are contained, was granted to Lopez Iñigo (also Indigo or Ynigo), a Native American documented as living in the vicinity of present-day Mountain View and farming what would become ARC lands as early as 1834 (NASA 2009; Garaventa et al. 1991). The grant was later patented in 1881, at which time the grant was known to have been divided into three parts: 448.02 acres to Iñigo's descendants, 847.98 acres to Robert Walkinshaw, and 400 acres to Thomas Campbell. Research indicates that the known remains of buildings associated with these ranchos are located outside of ARC land holdings. Iñigo is thought to have lived on-site until his death in 1864, and a modern marker entitled the "Inigo Grave Site" [*sic*] was erected by the Mountain View Pioneer and Historical Association on the perimeter road near the northeast corner of the airfield (Garaventa et al. 1991). Although the

marker is no longer standing, Iñigo's interment is believed located within the boundaries of resource CA-SCI-12/H.

U.S. Navy Dirigible Operations (1931–1935)

The agricultural land that would become Naval Air Station (NAS) Sunnyvale was purchased with funds raised by local citizens and civic leaders who were enthusiastic about the prospect of a naval airfield coming to the area. The civic group sold the land to the Navy for \$1, and NAS Sunnyvale was officially established on August 2, 1931.

Construction began on NAS Sunnyvale in October 1931. Hangar 1, the massive steel-frame structure built to house the dirigible USS *Macon*, the flagship for NAS Sunnyvale, was completed in April 1933. North and south of Hangar 1, two mooring circles were built to control and secure the USS *Macon*. The nose of the dirigible would attach to a telescoping mooring mast and the tail fin would attach to a stem beam (or bolster beam); the stem beam and mooring mast were attached to a track that allowed the USS *Macon* to be rotated and moved in and out of Hangar 1. West of Hangar 1, the Navy built a campus of buildings to support dirigible operations on the airfield. The Spanish Colonial-style buildings built in the area now known as the NAS Sunnyvale Historic District were based on designs by the Naval Bureau of Yards and Docks. East of Hangar 1, closer to San Francisco Bay, the former agricultural land was cleared and leveled, and an airfield with a single narrow runway was built. This small runway was originally used by F9C *Sparrowhawks*, small biplane fighters that accompanied (and could be carried by) the USS *Macon*. Within a short time, the original runway was expanded and two more small runways were added. NAS Sunnyvale was formally commissioned on April 12, 1933.

The USS *Macon* arrived at NAS Sunnyvale in October 1933 and was stationed there until February 1935, when the dirigible was damaged during a mission off the coast of Point Sur, California, and crashed in the Pacific Ocean. Soon after the crash, the Navy terminated its dirigible program and the airfield at NAS Sunnyvale was transferred to the U.S. Army Air Corps.

U.S. Army Air Corps (1935–1942)

In September 1935, the Navy transferred the airfield to the U.S. Army Air Corps for use in pursuit and observation operations. When the Airfield was occupied by the Army Air Corps, the Airfield's focus moved from lighter-than-air (LTA) operations to heavier-than-air aircraft used in pursuit and training operations. The Army Air Corps used bigger aircraft that required longer and wider runways, including the P-36 *Hawk* and BT-13 *Valiant*. In 1938, the Army Air Corps removed the older runway system and built a 2,140-foot-long runway (Runway 14R-32L) using 3-inch-thick asphalt concrete. Historic photographs taken during this period show a wide runway bordered on the west side by an apron or taxiway marked by diagonal lines. Parking areas surrounding Hangar 1 were unpaved earth (Veronico 2006).

In 1940, anticipating the outbreak of World War II, the Army Air Corps converted the airfield to become its West Coast training headquarters. In 1941, to accommodate larger aircraft used to train pilots and their support crew, Runway 14R-32L was extended again.

U.S. Navy Lighter-than-Air Operations and World War II (1942–1947)

After the bombing of Pearl Harbor in December 1941, the Navy reassumed control of the airfield, which was renamed the NAS Moffett Field, or simply Moffett Field. LTA operations were needed by the military once again, and Moffett Field became devoted exclusively to LTA aviation, primarily for reconnaissance and surveillance of the Pacific coast. Moffett Field was the headquarters for Fleet Airship Wing Three, composed of three LTA bases on the West Coast: Tillamook, Oregon; Tustin, California; and Sunnyvale, California. The first blimps arrived at Moffett Field as part of the West Coast's first LTA squadron, ZP-32, which launched its first patrol flight over the Pacific coast in February 1942 (Veronico 2006). Moffett Field was also used to train new airship pilots, using free balloons and blimps.

With the increase in LTA activity at Moffett Field, Hangar 1 was once again filled to capacity with K- and L-class nonrigid airships. In 1942, construction started on the first of two new enormous wood-frame hangars on the east side of the runways, which by this time had been expanded and reconfigured by the Army Air Corps. Hangars 2 and 3 were completed in 1943 and used by the Navy Station Assembly and Repair Department to assemble, erect, store, and maintain blimps and balloons (Gleason 1958). LTA operations continued at Moffett Field until August 1947 when the program was deemed obsolete and was terminated, making Moffett Field an exclusively heavier-than-air base (Gleason 1958).

Also during this period, the Navy started to focus more attention on expanding the base, including adding facilities for ammunition storage and heavier-than-air aircraft. In April 1942, the Navy purchased 225 acres east of the airfield, presumably to construct an ammunition storage area (Gleason 1958). In 1943, the Navy built a large munitions storage and loading area off the northeast corner of the airfield. The Navy chose this area because most munitions arrived at the Airfield by boat along the ferry channel, and because that was the most lightly occupied part of the airfield (NASA 2013). The munitions area included five magazines (now known as 070 to 074), a small bunker, an inert ammunition storage building, and nine fortified combat ammunition loading circles. The four magazines were concrete bunkers with cylindrical roofs set into a concrete front wall; lying 8 feet across from the door of these magazines was a matching berm with headwall that served as a blast deflector in case of accidental explosion. Concrete ramps were built to facilitate the transport of munitions from these magazines to the aircraft being readied for their missions. A safety buffer zone was outlined within the explosion arc of these magazines.

Beginning in 1943, the Navy started the first in a series of major changes to the airfield and surrounding areas after the Naval Bureau of Yards and Docks allotted \$1.12 million for new construction at Moffett Field (Gleason 1958). By this time, the Navy was flying larger and more powerful aircraft such as the PV-1 *Ventura* and Army B-26 *Marauders*, which required more modifications to the runway (Veronico 2006). In May 1944, Runway 14R-32L was extended to its present length with 11-inch Portland cement concrete, with anticipation of greater use by fixed-wing aircraft in the postwar period (NASA 2013).

U.S. Navy Transport Operations (1945–1950)

After World War II, Moffett Field became home to Squadron 4 of the Naval Air Transport Service, with support operations dedicated to aircraft maintenance and overhaul. It was during this period that most of the current-day airfield was built. Beginning in 1945, the Navy spent millions of dollars for improvements and new construction at Moffett Field (Gleason 1958). The airfield was expanded and extended to accommodate the Navy's largest transport aircraft, including a huge four-engine transport plane called the R5D *Skymaster* (Gleason 1958). In 1946, Runway 32R-14L was built of 8-inch-thick reinforced concrete to an original length of 7,425 feet. The west and east parallel taxiways were built, along with many of the parking aprons. In 1947, high-intensity approach, taxiway, and runway lights were added to the airfield (Gleason 1958). In the late 1940s, two more air transport squadrons (Squadrons 3 and 5) were commissioned at the base, making Moffett Field the largest Naval Air Transport Service base on the West Coast. Squadron 5—the first squadron in the Navy to have nuclear-weapon capabilities—flew the large patrol bombers P2V *Neptune* and AJ *Savage* (Gleason 1958). Moffett Field's Naval Air Transport Service overhaul and repair operations were closed down in October 1949 (Gleason 1958).

Korean War and U.S. Navy Jets (1950–1961)

The Korean War started in June 1950 and Moffett Field became the home base for aircraft carrier squadrons and their fighter jets. Jets were first introduced by the U.S. military during World War II, but did not appear at Moffett Field until 1950 with the arrival of the F3D *Skynight*, the Navy's first operational jet night fighter. Navy carrier squadrons stationed at Moffett Field used the airfield for training purposes, including simulated carrier landings. (Runways were equipped with emergency arresting gear similar to the equipment used to stop planes on aircraft carriers.) Moffett Field was also used to train pilots on new jet aircraft before they were first introduced into operational squadrons. Almost every new supersonic jet fighter aircraft in the Navy or U.S. Air Force inventories in the early 1950s was flight-tested at Moffett Field (NASA 2013). To support the new jets stationed at Moffett Field, two new squadrons were commissioned in March 1951 to provide maintenance services: Fleet Aircraft Service Squadron (FASRON) 10 was one of the first all-jet Fleet Aircraft Service squadrons in the Navy. One of its main roles was to repair damaged aircraft serving in the Pacific Fleet. The FASRON groups used Hangars 2 and 3 for maintenance operations.

In June 1951, to accommodate jet operations at Moffett Field, the Navy embarked on the largest post–World War II expansion program at the airfield. Because jet aircraft flew much faster and at higher altitudes than propeller-powered aircraft, the airfield at Moffett Field needed to be modified. Both runways were extended and resurfaced at least once; Runway 32R-14L was extended to 9,200 feet (U.S. Navy 1954). Taxiways were expanded; parking and apron areas were added; and new supply, transportation, garage, and barracks buildings were constructed (Gleason 1958). The Flight Operations Building (Building 158) was completed in February 1954 (Gleason 1958). The northeast area of the airfield near the coastline and magazines also saw changes during this period. Three new high-explosive magazines were built along Marriage Road (Buildings 143, 147, and 528), and an ordnance handling pad (Building 442) was added to

the northeast side of the airfield. In 1960, a golf course was built within the safety buffer zone surrounding the magazines as an acceptable low-occupancy use (NASA 2013).

Jet operations at Moffett Field were so extensive that the base was designated a master jet base in 1953 (the first of nine such Navy bases), and operational units on-site reached an all-time high in 1955. However, by the early 1960s, the Navy's operational priorities had changed, and the focus shifted from fighter jets to anti-submarine warfare. Jet operations at Moffett Field ended in 1961.

U.S. Navy Antisubmarine Warfare Operations (1962–1994)

In November 1962, Moffett Field was selected as the West Coast's training center for the Navy's anti-submarine warfare in the Pacific Ocean. The training was centered on the new propeller-driven anti-submarine aircraft, the Lockheed P3 *Orion*. The Pacific Fleet's first *Orion* arrived at Moffett Field in late January 1963, and for the next three decades the P3s would be a common sight over Moffett Field (U.S. Navy 1963). Pilots and technical crews were trained on the *Orion* in an area of the airfield nicknamed "Orion University," which included two World War II buildings in the California Air National Guard outlease area reconfigured for this use (Buildings 654, 655, and 669).

The P3 *Orion* had an internal bomb bay that could house torpedoes; nuclear weapons; and various other mines, missiles, and bombs. To store the weapons used for the *Orion* missions, specifically Mark 46 torpedoes, cluster bombs, and Bullpup or Harpoon missiles, the Navy added a new magazine facility to the safety buffer zone in 1965 (Buildings 561 and 484–492). In 1973, Moffett Field became the headquarters of the Commander Patrol Wings, U.S. Pacific Fleet, responsible for patrolling 93 million square miles of ocean from Alaska to Hawaii.

In 1991, the Base Realignment and Closure Commission recommended the closure of Moffett Field as a naval air station. On July 1, 1994, Moffett Field was closed to military operations, renamed Moffett Federal Airfield, and transferred to NASA (with the exception of the military housing units, which were transferred to the U.S. Air Force).

Jet Fueling Facility

As part of the program to expand the airfield to accommodate jet aircraft in 1951, the plan for a new fuel storage and distribution system developed. Historically, fuel arrived at Moffett Field by barge directly from refineries via the San Francisco Bay. In 1951, construction began on the jet fuel storage facilities, or fuel farm, consisting of four 15,170-barrel capacity USTs (Plate 1). Construction also began on a barge canal, fuel dock, and wharf at Guadalupe Slough, and a pipeline system that extended from the fuel dock along a jetty and onshore to connect to the fuel farm. Fuel was transported by pipeline from the fuel dock to the fuel farm area for long-term storage. This enabled the Navy to bring in large amounts of fuel by barge directly from the refinery, rather than by truck or railroad, saving time and money. From the fuel farm, an additional pipeline extended to a truck filling rack (Building 141) located southeast of Hangar 3, completed in 1953.



Source: U.S. Navy

Plate 1. Construction of Fuel Farm, 1951

The jet fuel facility was further developed in 1955 and 1956. A new branch of pipeline extended northwest from the fuel farm roughly parallel to Macon Road to a new aircraft-ready fuel day tank and pumping station (Building 953). The day tank area was designed for short-term jet fuel storage, holding fuel for a new cutting-edge, high-speed refueling system (MF1003) that was added in October 1956. The high-speed refueling system consisted of four fuel pits with fuel hydrants adjacent to the east parallel taxiway northwest of Hangar 2. The fuel hydrants allowed eight aircraft to be refueled simultaneously at the rate of 5 minutes per plane.

In 1978, additional pipeline was installed under the airfield to a new fuel farm with hydrants on the west side of the airfield for NASA. The NASA fuel hydrants were replaced in 1996. In addition, upgrades to the tanks and system were made in the 1970s and 1990s, including replacement of the jet fuel hydrants (Parsons 1996).

After the Navy vacated NAS Moffett Field in 1993 and Moffett Federal Airfield was transferred to NASA in 1994, the administration and management of fuel facilities became the responsibility of the Defense Logistics Agency (DLA), under the Department of Defense, as part of the Defense Fuel Supply Center (DFSC), a national program administered by the DLA. The DFSC

plans, programs, budgets, and funds the operation, maintenance, and repair of Defense Fuel Support Points (DFSPs) worldwide (Parsons 1996). The DFSP at Moffett Federal Airfield received, stored, and distributed JP-8 aviation fuel, ground vehicle fuel, liquid oxygen, and liquid nitrogen in support of military and federal activities through the 1990s (Parsons 1996). The DFSP fueling facility was closed in 2003. In 2012, the former pipeline crossing from the shore to the fuel dock and wharf was removed.

IDENTIFICATION OF HISTORIC PROPERTIES

The APE has been previously surveyed for archaeological and architectural resources, and was resurveyed for archaeological and architectural resources as part of the current undertaking.

ARCHAEOLOGICAL RESOURCES

The area just north of the truck filling rack (Building 141) was identified in the NASA Ames Final Programmatic Environmental Impact Statement as a “potentially archaeologically-sensitive area” (Design, Community & Environment 2002). The sensitive area, which is associated with the 19th century Gallimore farm, does not overlap with the APE (Design, Community & Environment 2002; Healy 1859). The remainder of the APE has not been identified as archaeologically sensitive. The project would include ground disturbance in areas where pipelines and USTs would be removed. Additional excavation may occur if contaminated soils are encountered during the pipeline and UST removal process.

A pedestrian survey of the APE was conducted on March 21, 2016, by Jennifer Redmond, M.A., RPA, an archaeologist who meets the Secretary of Interior’s Professional Qualifications Standards for Archaeology and History (36 CFR Part 61). Visibility of the APE was generally poor. The truck filling rack, day tank area, and runway apron were paved. The fuel farm and day tank areas were covered with fill. The APE between the truck filling rack and the fuel farm area and between the fuel farm area and Macon Road was covered in dense vegetation. Where the APE parallels Macon Road and East Patrol Road, it was situated in or adjacent to an excavated roadside ditch or ditch spoils. Survey was conducted along the route of the pipeline in the unpaved areas of the APE and exposed soils were closely examined for the presence of archaeological resources. Visible soils in the archaeologically sensitive area along Macon Road were also examined.

No intact archaeological resources were identified during the survey. Fragments of colorless and green bottle glass were identified along East Patrol Road, but these scattered fragments likely represent recent roadside discard. The APE is generally disturbed by prior construction, including the installation of the fuel pipelines, tanks, and other utilities. Exposed soils included fine-grained clay and imported fill, consistent with the U.S. Department of Agriculture’s (USDA) classification of the APE as Hangerone basin alluvium (drained, but historically seasonally wet) intermixed with Urban Land (disturbed and human-transported material) (USDA 2016). It is anticipated that ground disturbance would be limited to areas previously excavated for the installation of the pipeline and tanks, although the potential does exist that additional excavation would occur to remove contaminated soils.

ARCHITECTURAL RESOURCES

In 1999, a cultural resources survey identified 148 buildings and structures built between 1945 and 1989 and evaluated their significance related to the Cold War (SAIC 1999). The resources were evaluated under eligibility criteria for the National Register of Historic Places (NRHP), including Criteria Consideration G, because the resources were not 50 years old at the time of the evaluation. None of the resources in the study were recommended eligible for listing in the NRHP. The SHPO concurred with the determinations of eligibility on May 11, 1999 (see Appendix B). Buildings 137–140, Building 141, and Building 953 were determined not eligible for the NRHP, and are located in the current APE.

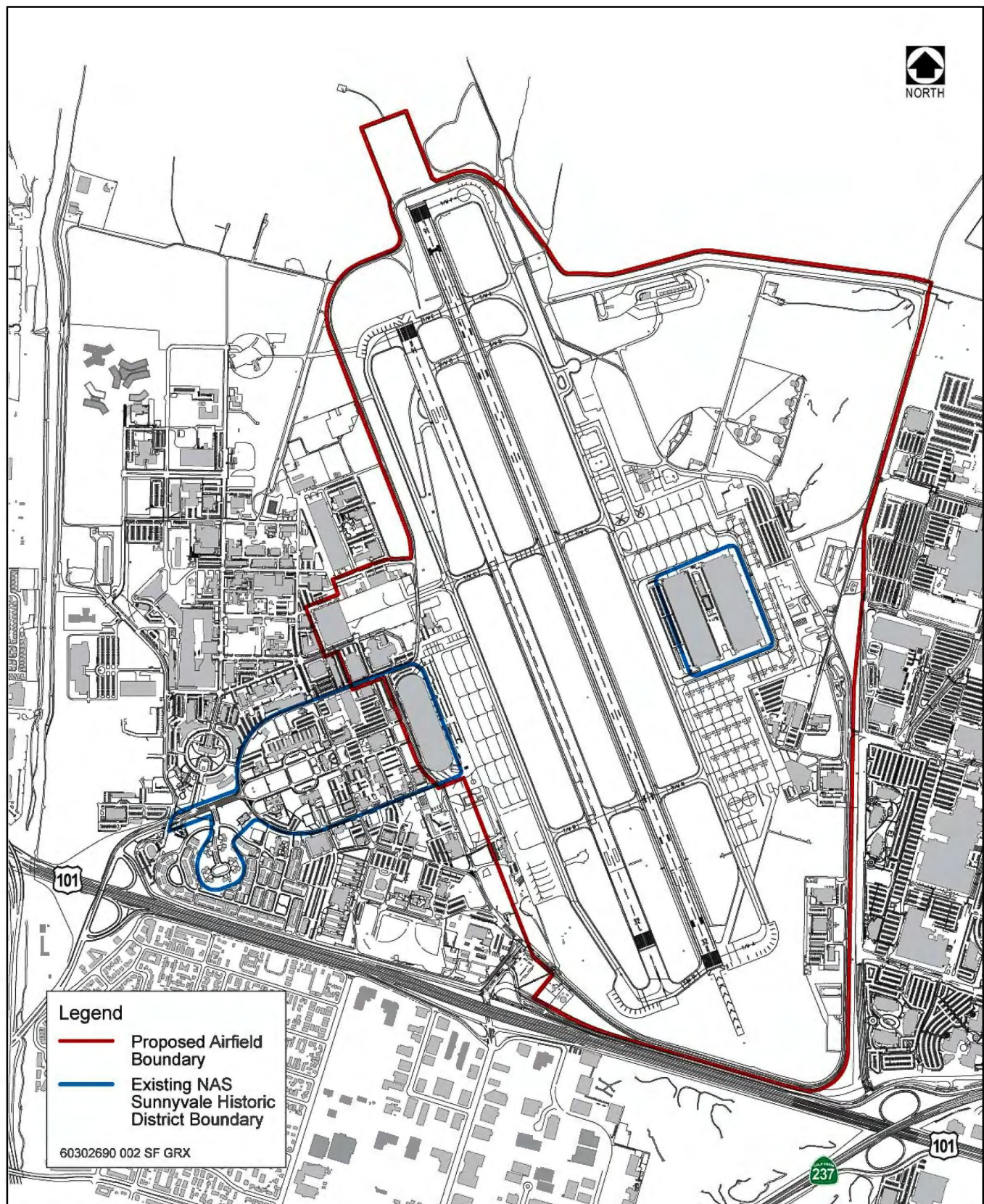
In 2013, NASA submitted a statement of significance for Moffett Federal Airfield to the SHPO and the Advisory Council on Historic Preservation (ACHP). NASA determined that the airfield and its component features were eligible for the NRHP under Criterion A as contributors to the NAS Sunnyvale (Shenandoah Plaza) Historic District, with an additional period of significance of 1942–1961, reflecting the jet aircraft program at the airfield. The SHPO concurred on June 6, 2013, that the airfield contributed to the significance of the NAS Sunnyvale Historic District (see Appendix B). In addition, the SHPO recommended that NASA develop a list or table of contributors to the district, specifying the character-defining features of the airfield, including landscape design. The nomination was not formally updated to include these areas.

At NASA's request and under the SHPO's recommendations, AECOM prepared the *Historic Property Survey Report for the Airfield at NASA Ames Research Center, Moffett Field, California* in 2013. The object of that study was to evaluate the airfield as a landscape, and to evaluate its eligibility and integrity. The study recommended the augmentation of the NAS Sunnyvale Historic District boundary to include the adjacent airfield (Figure 4). The 2013 Airfield study included a statement of significance for the airfield:

The Airfield is nationally significant under Criterion A as the central core facility of aviation-related research programs, as well as significant transport, training, and other aviation uses at the property. The Airfield's landscape is composed of a collection of buildings and structures that contribute to the adjacent NAS Sunnyvale Historic District under Criterion A. The Airfield's inclusion in the existing historic district expands the district's currently defined significance to include World War II and ongoing use of the Airfield for Cold War-era NACA, NASA, and military missions.

The evaluation also recommended a comprehensive period of significance of 1930–1961 for the NAS Sunnyvale Historic District to include significant post-World War II operations of the airfield (AECOM 2013).

The 2013 Airfield study identified a preliminary list of airfield features that could potentially contribute to the expanded NAS Sunnyvale Historic District that was based on general association and age related to the revised period of significance (Figure 5) (AECOM 2013).



Source: Data compiled by AECOM in 2013

Figure 4
Proposed Revised Boundary, NAS Sunnyvale Historic District

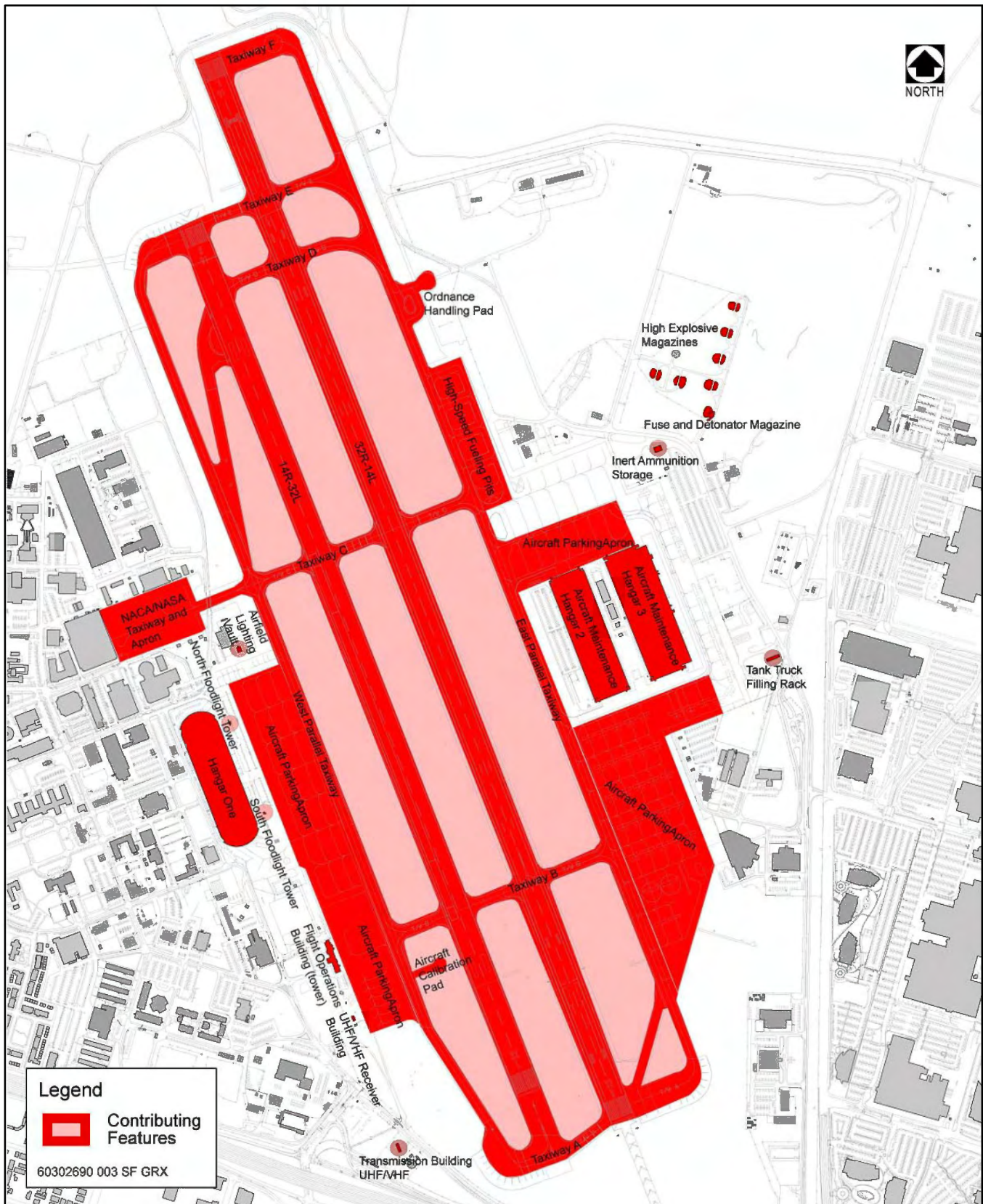


Figure 5
Preliminary Map of Contributing Airfield Features

However, these features were not fully evaluated for the NRHP and did not receive a determination of eligibility, and the SHPO did not provide a response regarding concurrence with the 2013 study's preliminary list of airfield features.

The APE includes five resources that were preliminarily identified as airfield features (AECOM 2013):

- Building 69, Inert Ammunition Storage
- Building 141, Tank Truck Filling Rack
- MF1002, Aircraft Parking Apron
- MF1003, High-Speed Aircraft Fueling Pits
- MF1016, Aircraft Taxiway Pavement

Of these resources, Building 141 and MF1003 are part of the DFSP, and are aircraft fueling features. The study pointed out that many of the fueling features were no longer operational and their individual conditions and historic integrity had not yet been determined (AECOM 2013). Secondary features including pipes, valves, and control features associated with former fueling systems were not evaluated because of the limited availability of information about their potential for significance and integrity (AECOM 2013).

An intensive architectural survey of the APE was conducted on March 21, 2016, by M.K. Meiser, M.A., an architectural historian who meets the Secretary of the Interior's Professional Qualifications Standards for Architectural History and History (36 CFR Part 61). The survey identified 15 resources, including previously surveyed features of the airfield and other resources over 50 years old, within the APE (Table 1). The remaining buildings and structures in the APE are not yet 50 years old or do not exhibit the potential for exceptional significance and, therefore, were not included for further evaluation. Of the 15 resources, three resources are listed in the NRHP as contributors to the NAS Sunnyvale Historic District, eight resources are features of the DFSP fueling facility, and the remaining four resources are miscellaneous features of the airfield.

Resource Descriptions

NAS Sunnyvale Historic District

The NAS Sunnyvale Historic District was listed in the NRHP in 1994 under Criteria A and C in the areas of Architecture and Engineering/Military with a period of significance of 1930–1935 and 1942–1946 (Urban Programmers 1994). The NAS Sunnyvale airfield (now known as Moffett Federal Airfield), including runways, taxiways, and other features, was excluded from the original district boundary, but was found eligible in the 2013 Airfield study as a contributor to the NAS Sunnyvale Historic District (AECOM 2013). This evaluation found that the airfield and its contributing elements were nationally significant under Criterion A as the central core facility of aviation-related research programs. The reevaluation also recommended that the period of significance be revised to 1930–1961 to include early 1950s jet operations, as well as the National Advisory Committee for Aeronautics and early NASA missions during the Cold

Table 1. Historic Architectural Resources Identified in the APE

Building No.	Historic Name (Current Name)	Year Built	Previous NRHP Evaluation
46	Hangar 2	1942	Listed (NAS Sunnyvale HD)
47	Hangar 3	1942	Listed (NAS Sunnyvale HD)
55	Boiler House (Hangars 2 and 3)	1943	Listed (NAS Sunnyvale HD)
69	Inert Ammunition Storage	1943	Potential Character-Defining Feature of Contributor (2013 Airfield Study)
137	Aircraft Fuel Storage Tank*	1952	Not Eligible (1999 Cold War Study)
138	Aircraft Fuel Storage Tank*	1952	Not Eligible (1999 Cold War Study)
139	Aircraft Fuel Storage Tank*	1952	Not Eligible (1999 Cold War Study)
140	Aircraft Fuel Storage Tank*	1952	Not Eligible (1999 Cold War Study)
141	Tank Truck Filling Rack*	1952	Not Eligible (1999 Cold War Study); Potential Character-Defining Feature of Contributor (2013 Airfield Study)
169	Vehicular Bridge*	1953	Not Evaluated
439	Aircraft Wash Rack	1942	Potential Character-Defining Feature of Contributor (2013 Airfield Study)
953	Aircraft Ready Fuel Day Tank and Pumping Station*	1956	Not Eligible (1999 Cold War Study)
MF1002	Aircraft Parking Apron	1945	Potential Character-Defining Feature of Contributor (2013 Airfield Study)
MF1003	High-Speed Aircraft Fueling Pits*	1955	Potential Character-Defining Feature of Contributor (2013 Airfield Study)
MF1016	Aircraft Taxiway (East Parallel)	1945	Potential Character-Defining Feature of Contributor (2013 Airfield Study)

*feature of the Jet (DFSP) Fueling Facility

War (AECOM 2013). Contributors to the NAS Sunnyvale Historic District that are listed in the NRHP include Hangars 2 and 3 and Building 55. Four other features of the airfield were identified in the 2013 Airfield study as potential contributing features to the NAS Sunnyvale Historic District.

Buildings 46 and 47 – Hangars 2 and 3

Hangar 2 (Building 46) and Hangar 3 (Building 47) are monumental features of the NAS Sunnyvale Historic District located on the east side of Moffett Airfield (Plate 2). Built in 1942, these twin structures are redwood-framed blimp hangars characterized by immense porticoes at their north and south ends. The buildings are listed in the NRHP as contributors to the NAS Sunnyvale Historic District. According to the NRHP nomination, the hangars are listed under Criteria A and C, as excellent examples of WWII-era blimp hangars, and are “significant more for their size than their unique styling or design... The more common design does not, however, detract from the sheer magnitude of the two huge buildings side by side. Along with Hangar #1, these two buildings help define the south San Francisco Bay Area from all distant directions” (Urban Programmers 1994).



Plate 2. Hangar 3 (Hangar 2 behind), view facing northwest from Building 141

Building 55 – Boiler House

The Boiler House (Building 55) is an associated feature of Hangars 2 and 3, located between the structures (Plate 3). It is listed in the NRHP as a contributor to the NAS Sunnyvale Historic District (Urban Programmers 1994). It served as the heat plant for Hangars 2 and 3.



Plate 3. Building 55, view facing northwest

Building 69 – Inert Ammunition Storage Building

Building 69 is a utilitarian storage facility with a rectangular plan, board-formed concrete walls, and a side-gabled roof covered with corrugated asbestos sheets (Plate 4). The north side of the building has a single entrance with reinforced metal double doors above a raised concrete platform or loading dock with steps and a ramp. The building has minimal fenestration, with two clerestory windows on the north and south sides of the building, and one each in the east and west sides of the building. The windows contain four-light, wood-framed sash. The building features two vents at the ridgeline. Built in 1943, Building 69 was constructed for inert ammunition storage. It continues to be used for storage.

Building 439 – Aircraft Wash Rack

This facility consists of a concrete slab, a metal shed structure, and washing equipment (Plate 5). Although originally built circa 1942, this facility has been rebuilt in recent decades and does not retain any discernible period features.



Plate 4. Building 69, view facing southeast



Plate 5. Building 439, at left, view facing southeast

MF1002 – Aircraft Parking Apron

This feature is a concrete apron used for aircraft access to Hangars 2 and 3, maintenance, and parking (Plate 6). The apron pad was added to the airfield in 1945.



Plate 6. MF1002, apron adjacent to Hangars 2 and 3, view facing southwest

MF1016 – Aircraft Taxiway (East Parallel Taxiway)

MF1016 is the East Parallel Taxiway that is a perimeter aviation circulation feature of the airfield (Plate 7). The taxiway consists of asphalt pavement at grade and extends along the eastern edge of the airfield adjacent to Hangars 2 and 3.

Jet Fueling Facility

The jet fueling facility (later known as the DFSP) includes a series of pipelines, tanks, valves, and pumps that once distributed fuel from the fuel dock on Guadalupe Slough to the airfield. Primary aboveground features of the DFSP include the fuel farm (Buildings 137–140); the tank truck filling rack (Building 141); a vehicular bridge (Building 169); the day tank area (Building 953); and four high-speed aircraft fueling pits and hydrants (MF1003). In addition, the facility includes underground pipelines and associated control features that extend from the fuel dock to the fuel farm, from the fuel farm to the filling rack and day tank area, and from the day tank area to the high-speed fueling pits along the east side of the airfield (see Figure 3). Two parallel 10-inch-diameter pipelines once extended 7,038 feet from the fuel dock to the fuel farm, although a portion of the pipelines between the fuel dock and the North Channel over wetland areas was removed in 2012. (The fuel dock [Building 167] was determined not eligible for the NRHP in 1999 [SAIC 1999] and the pipelines were subsequently removed after NASA

determined that the removal would not result in an adverse effect and completed review under the Programmatic Agreement between NASA, the SHPO, and ACHP, which expired in 2012.) Another 6-inch-diameter pipeline extends 1,165 feet from the fuel farm to Building 141. Additional 8-inch-diameter pipeline extends from 2,100 feet from the fuel farm to the day tank. From the day tank to the fueling pits, parallel 6-inch- and 14-inch-diameter pipelines extend 2,270 feet. The DFSP also connected to the NASA fuel facility, which is located on the west side of the airfield, via a 3,690-foot-long 8-inch-diameter pipeline that crosses beneath the taxiways and runways of the airfield, but was removed in 2009. Primary features of the DFSP in the APE are described below.



Plate 7. MF1016, taxiway pavement, view facing southwest

Buildings 137–140 – Aircraft Fuel Storage Tanks

Buildings 137–140 are four USTs located in the fuel farm (Plate 8). The fuel farm is a fenced area that contains the bulk storage tanks, pumps, an emergency generator, and containment kits. The series of USTs form a wide mound. The USTs are 14-foot-high round tanks with an 88-foot diameter, and each has a 15,170-barrel capacity. The tanks have concrete pad foundations and caps. Each tank is equipped with manual and automatic tank gauging equipment, an access manhole, issue and receipt valves, a motorized main pump, a sump pump, a visual alarm, and an automatic high-level shut-off valve located in pits atop each tank (Parsons 1996). Above each tank, a series of valves and controls are housed beneath sheds. Each shed consists of a steel frame enclosed with chainlink fencing and covered with corrugated metal roofing. Each shed has a single metal-grill door. The tanks are connected to the fuel farm pipeline manifold that connects to the pipeline system extending from the fuel dock and leading to Building 141 and MF1003 at the airfield.



Plate 8. Sheds housing UST controls (Buildings 137–140), view facing north

Building 141 – Tank Truck Filling Rack

The truck filling rack was constructed in 1952 (Plate 9). The facility is a utilitarian shed structure with steel framing and a corrugated metal pent-gabled roof. The rack has three drive-through bays for filling trucks and pipelines extending beneath the roof to each filling station. The building also has an operator's booth and extensive equipment for the control of the fuel. One bay in the truck filling rack was upgraded circa 2000 with modern equipment prior to closure.

Building 169 – Vehicular Bridge

Building 169 is a vehicular bridge that carries East Patrol Road and the DFSP pipelines over North Channel to a 0.75-mile jetty over wetlands and salt evaporation ponds leading to the former fuel dock on Guadalupe Slough (Plate 10). The bridge has concrete abutments, a wood plank deck, and wood rails. The deck has been modified with the addition of reinforced metal grating gauged for heavy vehicular traffic, and additional wood rails have been installed on each side of the deck.



Plate 9. Building 141, view facing west



Plate 10. Building 169 (Bridge), view facing northeast

Building 953 – Aircraft Ready Fuel Day Tank and Pumping Station

The day tank area is a fenced area that contains a 2,750-barrel UST for JP-8 aviation fuel and a pumping station (Building 953), a contaminated fuel storage tank, and a pit containing three transfer pumps (Plate 11). There is also an electrical substation located in the area. The facility processed jet fuel from the fuel farm for delivery to the airfield fueling pits and hydrants (MF1003) and the NASA fuel facility on the west side of the airfield. The UST is contained within an earthen and gravel mound. The day tank is equipped with manual and automatic tank gauging equipment, an access manhole, issue and receipt valves, an automatic high-level shutoff valve, and high-level and low-level sensor and audio and visual alarms (Parsons 1996). Controls for the tank are located above the tank and housed beneath a shed structure. The shed structure consists of a steel-framed shed with a corrugated metal roof. The day tank area includes the contaminated fuel removal system tank, which is a concrete, curbed containment structure with a capacity of 5,000 gallons.



Plate 11. Building 953, view facing south (Hangars 2 and 3 in the background)

MF1003 – High-Speed Aircraft Fueling Pits

MF1003 consists of four high-speed fueling pits located at the airfield, adjacent to the east parallel taxiway and the parking apron north of Hangars 2 and 3 (Plate 12). The fueling pits consist of four concrete pads surrounded with concrete berms with fueling hydrants at-grade (Plate 13). Four original fuel hydrants were installed by 1956, but were removed and are now capped. Four high-speed fuel hydrant stations were constructed in two phases; originally in 1976 and reconfigured in 1983 to replace the original skid-mounted hydrant stations. The original

hydrants were located northeast of the existing hydrant stations, in the center of each aircraft lane. The 1983 fuel hydrants were each equipped with a fire shutoff valve, strainer, filter/separator, control/emergency valve, static-retention chamber, deadman control, two surge suppressors, flow meter, venture, and a header connecting to three different nozzles for a pantograph and pressure refueling hose, a gravity refueling hose, and an additional spare nozzle (Parsons 1996). In the 1990s, four of the fuel hydrants were capable of high-speed pressure refueling and over-the-wing gravity refueling (Parsons 1996). The hydrants were removed circa 2003, although some of the surficial elements of the infrastructure (valves, piping, etc.) remain.



Source: Google Earth

Plate 12. Aerial photograph of MF1003 (square pads at center)



Plate 13. Aboveground fueling pits infrastructure (hydrants removed), view facing north

Resource Evaluations

To be eligible for listing in the NRHP, a property must be at least 50 years old and possess significance in American history and culture, architecture, or archaeology to meet one or more of four established NRHP criteria (36 CFR 60.4) through:

- A. Association with events that have made a significant contribution to the broad patterns of our history;
- B. Association with the lives of persons significant in our past;
- C. Embodiment of the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and/or
- D. Have yielded, or may be likely to yield, information important in prehistory or history.

Historic resources eligible for listing in the NRHP are considered “historic properties,” and may include buildings, sites, structures, objects, and historic districts. A potential historic property less than 50 years of age may be eligible under NRHP Criteria Consideration G if it can be demonstrated that sufficient time has passed to understand its historic importance (National Register Bulletin 15, page 43). In addition to meeting one of the NRHP criteria, a property must also retain integrity to be considered eligible for NRHP listing. The NRHP recognizes seven aspects or qualities that, in various combinations, define integrity: feeling, association,

workmanship, location, design, setting, and materials (National Register Bulletin 15, pages 44–45).

NAS Sunnyvale Historic District

The NAS Sunnyvale Historic District is listed in the NRHP, including its contributors Hangars 2 and 3, and Building 55. These buildings have not been significantly altered since the district was listed in 1994, and they retain integrity to remain listed in the NRHP.

As described above, the SHPO concurred with NASA that the airfield contributed to the significance of the NAS Sunnyvale Historic District, and was, therefore, eligible for the NRHP. Contributing features to the NAS Sunnyvale Historic District associated with the airfield were preliminarily identified, but not fully evaluated for NRHP eligibility (AECOM 2013). Historic features of the airfield were identified as those “directly associated with the facility’s core aircraft, transport, research, maintenance, and training mission, which has evolved throughout its history. These features include those used to support operations involving dirigibles, balloons, airplanes, rotorcraft, and jets. The facilities directly associated with this use include circulation features used by aircraft, such as runways, taxiways, parking and repair aprons, and compass calibration pads; buildings used to house aircraft, such as hangars; and buildings and structures directly involved in aviation operations, such as the fuel transport and storage system, repair shops, control towers, and aids to navigation (such as airport lighting)” (AECOM 2013).

The aircraft parking apron (MF1002) and aircraft taxiway (MF1016) are aviation circulation features that are directly associated with the aviation mission of the airfield dating to 1945 and the early transition of Moffett Field to accommodate jet aircraft immediately following World War II. These features were previously identified as contributing to the airfield (AECOM 2013). These features do not possess individual significance based on associations, design or construction techniques, or potential for historical information (NRHP Criteria A through D). However, as aviation circulation components, they are character-defining features of the airfield, which is in turn a contributor to the NAS Sunnyvale Historic District. Therefore, MF1002 and MF1016 are eligible for the NRHP as character-defining features of a contributor to the NAS Sunnyvale Historic District.

Built in 1943, Building 69 was constructed for inert ammunition storage. Building 69 is a utilitarian, board-formed concrete structure that served a support function to the installation and its mission, and was obsolete for the purposes of inert ammunition storage before the end of World War II. It is located in an isolated area to the north of Hangar 3. Individually, it does not exhibit significance based on associations, design or construction techniques, or potential for historical information (NRHP Criteria A through D). Furthermore, the building is not directly associated with the airfield’s core aircraft, transport, research, maintenance, and training mission. The building dates to the period of significance of the NAS Sunnyvale Historic District but does not have significant associations with the qualities that make the district eligible for the NRHP. The building is intact and retains integrity of location, design, materials, workmanship, feeling, and association, with a minimally diminished setting. However, it does not possess the associations necessary to be a character-defining feature of the airfield, or a contributor to the NAS Sunnyvale Historic District. It is not eligible for the NRHP.

Building 439, the Aircraft Wash Rack, was originally built circa 1942 but has been substantially altered and does not retain any discernible period features. It was previously identified as not eligible individually or as a contributing feature of the airfield (AECOM 2013). Due to substantial loss of integrity, this facility does not convey its historical associations, is not a character-defining feature of the airfield, and does not contribute to the NAS Sunnyvale Historic District. It is not eligible for the NRHP.

Jet Fueling Facility

Completed in 1953, construction of the jet fueling facility was part of a major effort to expand the airfield's capacity to accommodate jet aircraft during the Cold War era. The facility is associated with the Cold War build up at NAS Moffett Field as it became an important jet aircraft base, and it supported the aviation mission as a supply system to the airfield. The facility served a utilitarian and prosaic function, providing fuel through various truck and aircraft fueling stations around the airfield. While it represents the modern upgrade of airfield facilities to meet a new supply need related to jet aircraft in the early 1950s, the resource was not an integral factor in the development of the jet aircraft program at Moffett Field, which began in 1945 and terminated in 1961. It does not exhibit historical importance as a fuel supply system within the context of the development of the airfield or jet aircraft. Because of this, the fueling facility does not appear to meet NRHP Criterion A.

Research about the jet fueling facility has not revealed a specific association with a historically significant person. It does not appear to meet NRHP Criterion B.

The design and construction of the jet fueling facility represents the industrial methods of the 1950s. The steel pipelines, at 14-inch-, 10-inch-, 8-inch-, and 6-inch-diameter, are standard gauge pipes made from common materials. The USTs are constructed with concrete pads, tops, and lining, and steel siding, which is a typical design for fuel USTs. Building 141, the truck filling rack, has a utilitarian design including a corrugated metal gabled canopy and steel supports between the three filling bays. The piping and filling equipment, consisting of pipes, valves, and pumps, are standard issue elements, and do not represent a unique design. One component of the jet fueling facility, the high-speed fueling pits (MF1003), was at the forefront of jet aircraft refueling technology at the time it was installed in 1976 and reconfigured in 1983. While the high-speed fueling pits and hydrants have more technological significance related to the jet aircraft program at the airfield, they do not date to the period of significance related to the jet aircraft program at the airfield. In addition, these were not unique fueling hydrants within the Navy's jet aircraft programs in the 1970s and 1980s. The fueling facility as a whole system, including the former fuel dock, pipelines, fuel farm, day tank area, truck filling rack, and other elements, was not exceptionally engineered as a unique or groundbreaking system. Other, more significant DFSP fueling facilities that serviced the Navy's jet aircraft technology were also built earlier or in the same era, including the DFSP at San Pedro, California, with 34 USTs that continues to distribute jet fuels for military use. The design, construction, and technology associated with the jet fueling facility at Moffett Federal Airfield does not qualify it under NRHP Criterion C.

The jet fueling facility is well documented through photographs, original drawings and plans, and frequent maintenance records of the pipelines, USTs, day tank area, truck filling rack, and high-speed fueling pits. It is not likely to yield additional historical information that would qualify it under NRHP Criterion D.

Although the jet fueling facility does not meet NRHP criteria for eligibility as an individual resource, components of the system were identified in the 2013 Airfield study as potential character-defining features of the airfield landscape, which in turn was determined eligible for the NRHP as a contributor to the NAS Sunnyvale Historic District under an expanded period of significance of 1930 to 1961. The airfield, through its evolution as NAS Sunnyvale in the 1930s and NAS Moffett Field during World War II, and its associations with the NACA and NASA, was identified as an important aviation training, research, and development facility. In the postwar era, the airfield continued to be on the forefront of aviation technology development, including the development of jet aircraft at the designated master jet base from 1953 until 1961. The 2013 Airfield study identified Building 141, the truck filling rack, and MF1003, the high-speed fueling pits, as potential character-defining features of the airfield. However, the 2013 Airfield study did not evaluate the significance or assess the integrity of these features. The current study revisited these features for further evaluation and to assess their integrity.

Building 141, the truck filling rack, was completed in 1952 and served as a fueling station for large tank trucks that transported fuel from the rack to stations around the airfield. It was determined not eligible for the NRHP in 1999 (SAIC 1999; see Appendix B). The truck filling rack was closed in 2003. The utilitarian structure has undergone few alterations to the canopy and frame of the shed structure. The filling station equipment in each bay has been modified and upgraded over the years, with the most notable alteration being the replacement of the easternmost filling station with new equipment circa 2000. Its supply lines were closed in 2003. Overall, the truck filling rack conveys its historical appearance and purpose. However, the truck filling rack did not have a direct association with the jet aircraft program at the airfield, and does not represent a character-defining feature of the airfield in association with that mission. Building 141 is a minor feature of the airfield and does not exhibit a high level of historical significance related to the airfield and its aviation mission, and is not a character-defining feature of the airfield.

MF1003, the high-speed fueling pits, were not initially identified in the field survey of the 2013 Airfield study, most likely due to the prior removal of the fuel hydrants. The facility was identified due to its original construction date of 1955–56 within the period of significance for the airfield (1930 to 1961). This feature had a direct association with the aviation mission of the airfield. However, the high-speed fueling pits have undergone substantial changes since first constructed. The four original fuel hydrants were removed and their connections to the pipeline permanently capped. In addition, the facility was substantially changed with the introduction of four new fueling stations in 1976, and further reconfiguration in 1983. Most recent changes to the high-speed fueling facility included the removal of the 1983 fuel hydrants for closure in 2003. Due to the substantial alterations in materials and association, this facility does not retain sufficient integrity to convey its historical significance, and therefore, is not a character-defining feature of the airfield.

In summary, the jet fuel facility does not appear individually eligible for the NRHP, and the components of the jet fuel facility that were previously identified as potential character-defining features of the airfield either do not possess the level of significance to be contributing or do not retain sufficient integrity to be eligible as character-defining features of the airfield, which is a contributor to the NAS Sunnyvale Historic District.

ASSESSMENT OF EFFECTS

The Criteria of Adverse Effect pursuant to 36 CFR 800.5(a)(1) are applied to assess effects of the undertaking on historic properties within the APE:

(1) Criteria of adverse effect. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative.

IMPACTS DISCUSSION

The APE contains contributors to the NAS Sunnyvale Historic District that are listed in or eligible for the NRHP. The APE is located at Moffett Federal Airfield, within an area of the airfield that has been determined eligible for the NRHP for its contributions to an expanded NAS Sunnyvale Historic District (see Appendix B). Hangars 2 and 3, and Building 55 are listed contributors and the airfield (Moffett Field) is an eligible contributor to the NAS Sunnyvale Historic District. Character-defining features of the airfield in the APE besides the listed properties are MF1002 and MF1016. No archaeological resources were identified in the APE.

Under the project, approximately 7 acres would be disturbed. Several segments of pipeline (4,443 lineal feet), the fuel farm (four USTs and associated equipment), and day tank area (one UST and associated equipment) would be excavated and removed. Another 4,102 lineal feet of pipeline and the Truck Filling Stand (Building 141) would be cleaned, closed permanently, and abandoned in place. Surficial elements of the high-speed fueling pits (MF1016) would be removed. The project would not be feasibly reversible, including removal or abandonment in place of the DFSP.

Historic properties identified in the APE will not be directly impacted by the project. Although adjacent to the project, the potential for indirect impacts through the visual or contextual change resulting from the removal of subsurface pipelines and tanks and aboveground features of the fuel farm and day tank area are minimal. This potential is minimal due to the scale and visibility of these structures within the visual context of the NAS Sunnyvale Historic District or its contributors, Hangars 2 and 3, Building 55, and the airfield. The visual context and setting of the historic district are anchored in the formality and symmetry of the Spanish Colonial Revival-style Shenandoah Plaza campus, the utilitarian character and expansive hardscape of the airfield, and punctuated by the massive, iconic, and futuristic Hangar 1. The east side of the airfield is

also dominated by Hangars 2 and 3. Hangars 2 and 3 are massive structures, and Building 55 is located between them. The project will not significantly change the setting or any other integrity aspect of Hangars 2 and 3 or Building 55, and will have no adverse effect on these historic properties. Changes to smaller-scale, non-contributing buildings, structures, or features that are in secondary areas of the airfield are unlikely to have an impact on the integrity of the overall district or its primary contributors.

The airfield is an eligible contributor to the NAS Sunnyvale Historic District. The airfield includes the expansive network of runways, taxiways, hangars, and other features related to the aviation missions at Moffett Field in the expanded period of significance from 1930 to 1961. In addition, the airfield's setting reflects its continuous evolution to serve changing aviation missions since the 1930s, including modifications over time to accommodate new types of aircraft and the airfield expansion in the early 1950s through current ongoing changes (AECOM 2013). These changes allowed the airfield to remain at the forefront of scientific and aviation research and permitted its continuing use. The airfield is "defined to a great degree by its continuous evolution to serve the needs of aviation research for nearly a century. The layout of aviation areas has been modified over time to accommodate new types of aircraft and allow the facility to continue to carry out its historic mission of cutting-edge aviation research" (AECOM 2013). As the 2013 Airfield study pointed out, upgrading obsolete aviation features to continue the mission of the Airfield does not have the same negative impacts to integrity that would occur should unrelated new construction destroy historic aviation features (AECOM 2013). Elements of the airfield in the APE that are considered character-defining include MF1002, an aircraft parking apron, and MF1016, an aircraft taxiway. The project will not have direct impacts on these two aviation circulation features of the airfield landscape, and will not indirectly impede their ability to convey their significance related to the airfield.

Overall, the project would not diminish the integrity of the NAS Sunnyvale Historic District as a whole, or any of its characteristics that qualify the property for inclusion in the NRHP. The enlarged district is characterized by its monumental hangars (Hangars 1, 2 and 3), its Spanish Colonial architecture at Shenandoah Plaza, and its associations with aviation missions at the airfield. While the jet fueling facility supported the jet aircraft aviation mission, it is not a character-defining feature of the airfield, and is not a contributor to the district. As an active technological research facility, a greater degree of flexibility when considering changes to support ongoing uses is appropriate, as reflected in guidance in the Advisory Council for Historic Preservation's (ACHP) 1991 *Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities* (ACHP 1991) that accounts for the changing nature of scientific research facilities. Periodic modifications to the research facilities are necessary for these facilities to continue their functions and maintain their significance under the NRHP Criteria. The historic properties would continue to convey their historical significance, and their integrity of location, design, materials, workmanship, and association, would not be diminished. Therefore, the project would result in no adverse effect.

An archaeological inventory was completed and no archaeological resources were identified. Although no archaeological resources were identified, the project would have the potential to affect unknown subsurface archaeological resources through excavation related to removal of

subsurface elements of the DFSP. Excavation would not exceed the depth or width of the existing pipelines, to an approximate maximum depth of 10 feet in some areas. If there are no objections from the SHPO, NASA will allow the excavation to proceed without further action or monitoring, except responding to the inadvertent discovery of archaeological deposits. In the event there is an inadvertent discovery of archaeological resources during the project, NASA would follow its best practices for unanticipated discoveries as outlined in Standard Operating Procedure 8: Inadvertent Discoveries in the 2014 Draft Integrated Cultural Resources Management Plan (AECOM 2014).

CONCLUSION

As a result of this evaluation, MF1002, an aircraft parking apron, and MF1016, an aircraft taxiway, are recommended as character-defining features of the airfield, which is an eligible contributor to the NAS Sunnyvale Historic District under NRHP Criterion A.

As a result of the assessment of effects, it appears that the project will have no adverse effect on the NAS Sunnyvale Historic District as a whole, or its contributors located in the APE, including Hangars 2 and 3, Building 55, and the airfield. The significance of these historic properties is associated with aviation missions related to several themes, including the Navy dirigible and LTA operations, the Army Air Corps's research and mission, Navy transport operations, and Navy jet aircraft operations. The project proposes the permanent closure and partial removal of the DFSP, historically the jet fueling facility, which served a supporting utilitarian function of the airfield during the period of significance from 1953 to 1961, and was closed in 2003. Due to its support function and the compromised integrity of some of its significant components directly related to the aviation mission of the airfield, the jet fueling facility does not appear eligible for listing in the NRHP individually, as a contributor to a historic district, or as a character-defining feature of the airfield. In applying the Criteria of Adverse Effect and the ACHP's guidelines for considering the changing nature of highly technical facilities in assessing the effects of project activities, it appears that a finding of no adverse effect is appropriate.

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1994 *National Register of Historic Places District Nomination: US. Naval Air Station Sunnyvale, California Historic District*. Nomination prepared for National Park Service.

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2016 *Custom Soil Resource Report for Santa Clara Area, California, Western Part*. Washington, D.C.: USDA. Available online at websoilsurvey website, http://websoilsurvey.sc.egov.usda.gov/WssProduct/dn3gpjloedmg5uixrov33qf/GN_00000/20160321_16442604109_39_Soil_Report.pdf.

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2006 *Moffett Field*. Charleston, SC: Arcadia.

APPENDIX A

PREPARERS' QUALIFICATIONS



Trina Meiser, MA

Senior Historic Preservation Planner

Areas of Expertise

Architectural History
Historic Architectural Assessment
Historic Preservation Planning
NHPA Section 106 Consultation
NEPA Compliance
CEQA Compliance

Education

MA, Historic Preservation Planning, Cornell University
BA, History, Kenyon College

Trina Meiser is a historic preservation planner and meets the Secretary of Interior's qualifications (36 CFR Part 61) in architectural history and history. Ms. Meiser has more than 10 years of experience in identifying and planning for cultural resources, including historic structures, districts, and landscapes. She specializes in technical analysis to support regulatory compliance, specifically under the California Environmental Quality Act (CEQA), Section 106 of the National Historic Preservation Act and the National Environmental Policy Act (NEPA). She conducts cultural resources studies, including inventory, survey, and evaluation reports; impacts analyses and findings of effect; National Register of Historic Places (NRHP) nominations; and Historic American Buildings Survey (HABS)/Historic American Engineering Record (HAER) documents. She consults on a variety of rehabilitation, transportation, energy, military, and community projects with clients, designers, and agencies. Her experience in historic preservation provides a strong understanding of federal, state, and local regulations and a thorough knowledge of the Secretary of the Interior's Standards for the Treatment of Historic Properties and their function in architectural design and historic preservation planning.

Experience

California High Speed Rail Authority, California High Speed Train Project, Merced to Fresno Segment, Central CA

Inventoried and evaluated more than 400 properties in Merced, Madera, and Fresno Counties in compliance with CEQA and Section 106. Evaluations were conducted under a Programmatic Agreement between the State Historic Preservation Office and the California High-Speed Train Authority.

Los Angeles County Metropolitan Transportation Authority (LACMTA) /FTA, Regional Connector Cultural Resources Mitigation Management Plan and HABS, Los Angeles, CA

Under on-call contract, prepared mitigation management plan to fulfill requirements set forth in an MOA and EIS/EIR in compliance with CEQA and Section 106 for the project to connect two light-rail transit lines in downtown Los Angeles. Prepared HABS CA-2907 documentation of the Atomic Café in Little Tokyo, Los Angeles.

LACMTA, Lankershim Depot Project, Los Angeles, CA

Under on-call contract, provided consultation services and review of architectural plans and construction to determine whether the project to rehabilitate a late 19th century railroad depot is in adherence with the Secretary of Interior's Standards, in compliance with CEQA. Consultation services under LACTMA master contract.

LACMTA, Los Angeles Union Station HVAC and Roofing Replacement Project, Los Angeles, CA

Provided consultation services and review of architectural plans and construction to determine whether the project to replace the roof and mechanical systems of the historic train station is in adherence with the

Secretary of Interior's Standards, in compliance with CEQA.
Consultation services under LACMTA master contract.

**LACTMA, South Bay Metro Green Line Extension Project,
Los Angeles County, CA**

Conducted cultural resources technical studies for transportation project through metropolitan LA to meet Section 106 requirements. Prepared technical report and the cultural resources portion of the EIS/EIR in compliance with NEPA and CEQA, including mitigation measures for the treatment of evaluated historical resources.

**Expo Authority, Exposition Corridor Transit Project Phase 2,
Los Angeles County, CA**

Prepared technical report for the evaluation of historical resources and the cultural resources portion of environmental impact statement/report under NEPA and CEQA. Elements for Section 106 consultation included the requesting determination of cultural resources and proposing mitigation measures for the treatment of historic properties.

**National Aeronautics and Space Administration (NASA), NASA Ames
Research Center Integrated Cultural Resources Management Plan
(ICRMP) and Center-wide Programmatic Agreement, Moffett Field,
CA**

For NASA, preparing an ICRMP for the Ames Research Center, including the NAS Sunnyvale Historic District. Coordinating with NASA staff to develop best practices for the management of cultural resources. Also drafting the Programmatic Agreement between NASA, CA SHPO, and consulting parties for the streamlined treatment of historic properties.

**NASA, NRHP Nominations for Various Properties at Ames Research
Center, Moffett Field, CA**

Preparing NRHP nominations for several properties at the Ames Research Center, including the new Ames Wind Tunnel Historic District, the Administration Building, and the Arc Jet Laboratory.

**Lowe Enterprises, LLC, Town and Country Redevelopment Project,
San Diego, CA**

Preparing Historical Resources Technical Report according to the City of San Diego's guidelines for the evaluation of historical resources. This task includes evaluating several buildings with varying architectural styles and periods of significance, and the assessment of impacts to historical resources for an environmental impact report in compliance with CEQA.

**City of San Diego, World Trade Center Rehabilitation Project,
San Diego, CA**

Evaluated the condition and integrity of the 1928 Art Deco-style San Diego Athletic Club. Prepared documentation in support of CEQA and Section 106 consultation on behalf of the City of San Diego under requirements of the Department of House and Urban Development.

City of San Marcos General Plan Update, San Marcos, CA

Assisted with the comprehensive update of the San Marcos General Plan for cultural resources. Assisted with the preparation of land use alternatives that preserve the City's character while allowing new pedestrian-friendly, mixed-use development in key focus areas of the City, and analyzed potential impacts to historic resources.

California Department of Transportation (Caltrans), State Route 94 Express Lanes Project, San Diego, CA

As project manager for cultural resources studies, conducted historic and archaeological surveys and evaluations of resources within the Area of Potential Effects for a segment of State Route 94 widening in a highly urbanized area of San Diego. Prepared Historic Property Survey Report and Historical Resources Evaluation Report to Caltrans standards, in compliance with CEQA and Section 106.

Caltrans, State Route 76 Mission to Interstate 15 Historical Resources Evaluation Report, San Diego County, CA

Conducted fieldwork to record and evaluate ranching buildings and residences. Prepared the Historical Resources Evaluation Report per Caltrans standards for the evaluation of historical resources for eligibility to the National Register and California Register, in compliance with CEQA and Section 106.

Caltrans, Interstate 5/State Route 56 Project, San Diego, CA

Conducted supplemental cultural resources studies for the project located in San Diego County. Surveyed resources within the Area of Potential Effects to analyze potential impacts to historical resources. Summarized findings in the Historical Resources Evaluation Report and Historic Property Survey Report per Caltrans standards, in compliance with CEQA and Section 106.

Caltrans, Orangethorpe Avenue Grade Separation Project, Orange County, CA

Conducted cultural resources studies for the project located in an urbanized area in the cities of Placentia and Anaheim in northeastern Orange County. Evaluated resources within an Area of Potential Effects to recommend eligibility to the National Register and California Register, and completed the Historical Resources Evaluation Report per Caltrans standards, in compliance with CEQA and Section 106.

Caltrans, Raymond Avenue Grade Separation Project, Orange County, CA

Conducted fieldwork to evaluate historic resources within the project's Area of Potential Effects located along a primary arterial highway in Fullerton. Completed the Cultural Resources Survey Report with recommendations on eligibility to the National Register and California Register, in compliance with CEQA and Section 106.

County of San Diego, South Santa Fe Avenue Reconstruction Project – South Segment, San Diego County, CA

Completed the Historic Property Survey Report and Historical Resources Evaluation Report per Caltrans standards to analyze resources and recommend eligibility to the National Register and California Register, in compliance with CEQA and Section 106.

County of San Bernardino, Shadow Mountain Grade Separation Project, San Bernardino County, CA

Prepared technical report for the evaluation of historical resources along a portion of Historic Route 66 in San Bernardino County. Evaluated more than 10 resources and assessed impacts to historical resources under CEQA.

County of San Diego, Rancho Santa Fe Roundabouts Project, Rancho Santa Fe, CA

Assessed significant impacts to the significant resource, the community of Rancho Santa Fe, in a Historical Resources Evaluation

Report Addendum and Historic Property Survey Report. Established the historic character-defining features to be preserved in compliance with the Secretary of Interior's Standards, in compliance with CEQA.

County of San Diego, West Mission Bay Drive Bridge Project, San Diego, CA

Conducted supplemental cultural resources studies for the bridge improvement project located in San Diego County. Surveyed resources within the Area of Potential Effects to analyze potential impacts to historical resources. Summarized findings in the Historical Resources Evaluation Report and Historic Property Survey Report per Caltrans standards.

GSA, San Ysidro Land Port of Entry Historic Customs House Rehabilitation Project, San Diego, CA

Consulted with architects to ensure environmental compliance with the Secretary of Interior's Standards in rehabilitation project design of NRHP-listed Historic Customs House. Prepared documentation for Section 106 consultation.

US Navy, Naval Base Point Loma Integrated Cultural Resources Management Plan (ICRMP), San Diego, CA

For NAVFAC, Southwest Division, prepared ICRMP for facilities at Naval Base Point Loma and evaluating World War II- and Cold War-era buildings. Coordinated with NAVFAC staff to develop best practices for the management of cultural resources on the naval base.

US Navy, National Register Eligibility Assessment for Naval Base China Lake, China Lake, CA

For Naval Facilities Engineering Command (NAVFAC) Southwest, recorded and evaluated various unrecorded buildings in the NRHP-eligible China Lake Pilot Plant Historic District at Naval Weapons Station China Lake for eligibility to the NRHP. Completed inventory forms and a technical report.

US Veterans Administration, Veterans Affairs Medical Center (SFVAMC) Seismic Upgrade Project, San Francisco, CA

Consulted with architects and designers for the rehabilitation and seismic retrofit of the 1930s-era Art Deco SFVAMC buildings. Evaluated design of new additions and alterations to contributing buildings to a National Register-listed historic district. Engaged in Section 106 consultation with the SHPO.

US Coast Guard, Los Angeles Harbor Light Station Rehabilitation Project, San Pedro, CA

Under IDIQ contract, evaluated potential adverse effects to NRHP-listed "Angel's Gate" lighthouse. Conducted historical research to determine historically significant and character-defining features. As consultant to US Coast Guard, prepared Finding of No Adverse Effect for Section 106 consultation.

US Coast Guard, Cape Arago Lighthouse Mothballing Project, Chief's Island, OR

Under IDIQ contract, prepared a Conditions Assessment with management recommendations for the Cape Arago Lighthouse as part of a mothballing plan. After assessing building materials of the lighthouse, applied technical guidance to identify appropriate treatments for preliminary maintenance prior to mothballing.

Jennifer Redmond, RPA

Archaeologist

Areas of Expertise

Historical Archaeology
NHPA Compliance
NEPA/CEQA Compliance

Education

BA/Anthropology and Earth &
Planetary Science/2003/University
of California, Berkeley
MA/Cultural Resources
Management/2009/Sonoma State
University

Licenses/Registrations

2011/Registered Professional
Archaeologist (RPA)

Years of Experience

With AECOM <1

With Other Firms 9

Professional Associations

Society for California Archaeology
(SCA)
Society for Historical Archaeology
(SHA)

Training and Certifications

2001/Geologic field school (University
of California, Berkeley)
2001/Archaeological field school
(University of California, Berkeley)
2002/Artifact illustration (University of
California, Berkeley)
2004/Mine safety training (Molycorp)
2006/California Historical Resources
Information System (CHRIS)
internship (Sonoma State
University)

Ms. Redmond has nearly ten years of experience in cultural resources management and archaeology throughout California and the Midwest. She conducts archaeological, archival, ethnographic, and historical research and directs field surveys and construction monitoring programs. She has extensive experience coordinating review on federal projects and ensuring compliance with the National Historic Preservation Act (NHPA), including determinations of eligibility, and the National Environmental Policy Act (NEPA). As an archaeologist, Ms. Redmond has assisted with and managed cultural resources programs in support of numerous NEPA and CEQA projects for clients in urban, rural, inland, and coastal settings in California.

Experience

Federal Emergency Management Agency (FEMA), 139 N. Main Street Acquisition/Demolition Project, Findlay, OH, 2015 (Environmental and Historic Preservation Specialist) Coordinated environmental and cultural resources reviews and consulted with the Ohio State Historic Preservation Office, Ohio Emergency Management Agency, and other interested parties to mitigate adverse effects to a property previously listed on the National Register of Historic Places as a contributing element to the Findlay Downtown Historic District. Coordinated development of a Memorandum of Agreement (MOA) pursuant to Section 106 of the NHPA to resolve adverse effects.

FEMA, Gays Mills Grade School Acquisition/Demolition Project, Gays Mills, WI, 2014-2015 (Environmental and Historic Preservation Specialist) Coordinated environmental and cultural resources reviews and consulted with the Wisconsin State Historic Preservation Office, Wisconsin Emergency Management, and other interested parties to mitigate adverse effects to a property previously determined eligible for listing on the National Register of Historic Places. Coordinated development of an MOA pursuant to Section 106 of the NHPA to resolve adverse effects and completed archival research and recordation fieldwork to satisfy stipulations in the MOA.

FEMA, Loyalsock Game Farm, Lycoming County, PA, 2012 (Historic Preservation Specialist) Conducted archaeological and historical research, directed cultural resources monitoring during construction activities, and prepared Section 106 compliant documentation.

FEMA, Holmes Run Sewer Replacement Project, Alexandria, VA, 2012 (Historic Preservation Specialist) Conducted archaeological and historical research, directed cultural resources monitoring during construction activities, coordinated with construction crews and City of Alexandria Archaeology Museum staff, and prepared Section 106 compliant documentation.

Forest Preserve District of Cook County, Cal-Sag Trail Expansion Project, Riverdale, Cook County, IL, 2011 (Archaeologist) Assisted with fieldwork and laboratory analysis for Phase III excavation in advance of bicycle trail construction.

Verizon Wireless, E. 550N Road Proposed Cell Tower Project, Gibson City, Ford County, IL, 2011 (Archaeologist) Conducted archaeological, historical, and archival research; directed the Phase I archaeological survey; and prepared an Archaeological Survey Short Report.

Verizon Wireless, 2350 W. Highway 176 Cell Tower and Access Route Project, Mundelein, Lake County, IL, 2011 (Archaeologist) Conducted archaeological, historical, and archival research; directed the Phase I archaeological survey; and prepared an Archaeological Survey Short Report.

enXco, Goose Lake-Memo Proposed Solar Facility Development Project, Kern County, CA, 2010 (Archaeologist/Cultural Resources Lead) Conducted archaeological, historical, and archival research and consulted with local Native American tribal representatives. Directed the archaeological survey, and co-authored a cultural resources assessment report.

enXco, Lost Hills-Dulgarian Proposed Solar Facility Development Project, Kern County, CA, 2010 (Archaeologist/Cultural Resources Lead) Conducted archaeological, historical, and archival research and consulted with local Native American tribal representatives. Directed the archaeological survey, and co-authored a cultural resources assessment report.

Caltrans, South Main Street and Soda Bay Road Widening and Bike Lanes Project, Lakeport, CA, 2009 (Archaeologist) Assisted with fieldwork and laboratory analysis for Phase I and II excavations in advance of bicycle trail construction. Contributed to preparation of the Archaeological Survey Report (ASR), Extended Phase I (XPI), Phase II Archaeological Evaluation Report (AER), and Historic Property Treatment Plan (HPTP).

Treasure Island Development Authority, Treasure Island Redevelopment Plan Project, San Francisco, CA, 2008 (Archaeologist) Conducted archaeological, archival, ethnographic, and historic research for inclusion in an Archaeological Research Design and Treatment Plan (ARDTP).

Forest City Residential Inc., Uptown Mixed-Use Project, Oakland, CA, 2007 (Archaeologist) Assisted with laboratory analysis, historical research, and report preparation for CEQA compliance.

Chronology

08/15 – Present: AECOM, Archaeologist, Oakland, CA

10/11 – 06/15: Federal Emergency Management Agency, Environmental Protection Specialist/Historic Preservation Specialist, Chicago, IL

07/11 – 12/11: Illinois State Archaeological Survey, Archaeological Specialist, Rockford, IL

09/08 – 09/10: LSA Associates, Inc., Cultural Resources Analyst, Pt.
Richmond, CA

06/06 – 10/08: Archeo-Tec, Consulting Archaeologist, Oakland, CA

Contact Information

AECOM

1333 Broadway, Suite 800

Oakland, CA 94612-1924

Tel: 510.893.3600

Direct: 510.874.3265

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jennifer.redmond@aecom.com

APPENDIX B

SHPO CORRESPONDENCE

**OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION**

P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-8624 Fax: (916) 653-9824
calshpo@mail2.quiknet.com



May 11, 1999

REPLY TO: NASA981026A

Michael D. Makinen, Historic Preservation Officer
National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD CA 94035-1000

Re: Cold War Era Survey, Moffett Federal Airfield, Santa Clara County and Crows
Landing Flight Facility, Stanislaus County.

Dear Mr. Makinen:

Thank you for submitting to our office the Final Inventory and Evaluation of Cold War Era Historical Resources (Survey) for Moffett Federal Airfield, Santa Clara County and the National Aeronautics and Space Administration (NASA) Crows Landing Flight Facility, Stanislaus County. The final Survey report was submitted by NASA in response to a request contained in our letter of February 24, 1999. In that letter we requested the final version of the Survey as a contingency document for our earlier concurrence with NASA on the eligibility of 148 properties located at Moffett Field and Crows Landing for inclusion on the National Register of Historic Places (NRHP).

Our review of the submitted Survey report lead us to conclude that the documentation contained in the final version of the Survey is consistent with earlier versions of the study that led to our original concurrence on the National Register eligibility of the aforementioned 148 properties.

Thank you again for consulting with our office regarding your project. If you have any questions, please contact staff historian Clarence Caesar at (916) 653-8902.

Sincerely,

Daniel Abeyta, Acting
State Historic Preservation Officer

**OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION**

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SACRAMENTO, CA 95816-7100
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calshpo@parks.ca.gov
www.ohp.parks.ca.gov



June 6, 2013

Reply In Reference To: NASA_2013_0417_001

Keith Venter
Historic Preservation Officer
Facilities Engineering Branch
NASA Ames Research Center
Mail Stop 213-8
Moffett Field, CA 94035

RE: Section 111 Outlease for Hangar One and Moffett Federal Airfield, NASA Ames Research Center, Moffett Field, CA

Dear Mr. Venter:

Thank you for your April 15, 2013, letter regarding the proposed undertaking in at NASA Ames Research Center (ARC). NASA is consulting with the State Historic Preservation Officer (SHPO) in order to comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470f), as amended, and its implementing regulations at 36 CFR Part 800. Along with the letter, NASA also provided property maps and a report entitled "Moffett Federal Airfield, Construction History and Historical Significance," dated April 12, 2013.

The proposed undertaking, as described, involves the proposed offer for lease to a private sector entity, pursuant to Section 111 of the NHPA, of Hangar One and Moffett Federal Airfield. On behalf of NASA, the General Services Administration (GSA) will issue a request for proposal (RFP) that will include a commitment by the lessee to rehabilitate and adaptively reuse Hangar One and manage and maintain Moffett Federal Airfield in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

NASA defined the Area of Potential Effects (APE) as the entire NASA Ames Research Center. Known historic properties located within the APE include the U.S. Naval Air Station Sunnyvale, CA, Historic District (commonly referred to as the Shenandoah Plaza Historic District), which is listed in the National Register of Historic Places (NRHP). Other individually eligible buildings, including one National Historic Landmark, are also located within the APE. The APE also contains a number of archaeological sites and sensitivity areas, but these are not described in detail in the information provided by NASA.

Although the historic district was listed in 1994, the nomination did not address the airfield or adjacent Safety Buffer Zone. In the report submitted, NASA concludes that Moffett Federal Airfield (under NRHP Criterion A) and the Safety Buffer Zone (no NRHP Criterion specified) are both contributors to the historic district. The period of significance for the historic district is currently 1930-1935 and 1942-1946, and NASA proposes a period of significance for the airfield of 1942-1961. No period of significance is specified for the Safety Buffer Zone.

NASA requests SHPO concurrence with the new determinations of eligibility for these properties. Upon receipt of responses to the RFP, GSA and NASA will choose the best qualified lessee and submit the proposal to SHPO for further consultation.

After reviewing the information submitted to my office, the SHPO offers the following comments:

- The SHPO concurs that leasing Moffett Federal Airfield and Hangar One constitutes an undertaking.
- The SHPO recommends that NASA and GSA officially designate a lead agency for the consultation pursuant to 36 CFR 800.2(a)(2).
- The APE appears to be sufficient pursuant to 36 CFR 800.4 (a)(1) and 800.16(d).
- The SHPO concurs that Moffett Federal Airfield and the Safety Buffer Zone contribute to the significance of the Shenandoah Plaza Historic District. However, further information should be developed specifying the character defining features of these contributors, including landscape design.
- The SHPO recommends that NASA develop a list or table of contributors to the district for submission to this office and for the information of the potential lessees. It is unclear from the report submitted to this office if the golf course or munitions magazines contribute to the district.
- Has NASA prepared an integrated cultural resources management plan (or similar document) that includes treatment plans for archaeological resources? If so, how will the treatment plan be accounted for in the Section 111 lease?

The SHPO agrees with the proposed plan for continuing consultation on this undertaking. Thank you for seeking my comments and considering historic properties as part of your project planning. If you have any questions, please contact Mark Beason of my staff at (916) 445-7047 or mark.beason@parks.ca.gov.

Sincerely,



Carol Roland-Nawi, Ph.D.
State Historic Preservation Officer

AGREED: _____

DATE: _____

Keith Venter
Historic Preservation Officer
NASA Ames Research Center

CC: Jane Lehman, Regional Historic Preservation Officer
General Services Administration

